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CORRECTIONS

IN THE

NOMENCLATURE OF FERNS OF BRITISH INDIA.

Cheilanthes tenuifolia	... Cheilanthes Mooreana	=	Mett.
Pteris ensiformis	... Wall.	=	Pteropsis pteroides	=	H.
Davallia solida	... Wall.	=	Drynaria conspicua	=	Lang.
Adiantum emarginatum	... Bory	=	Adiantum subpumilum	=	Fée.
Gleichenia glauca	... Wall.	=	Gleichenia longissima	=	H.
Polystichum aristatum	... Kze.	=	Polystichum Kunzeanum	=	Desv.
Lastrea multipunctata	... Hook.	=	Lastrea sagenioides	=	Mett.
Lastrea melanocaula	... Hook.	=	Polypodium distans	=	Don.
Lastrea subcordata	... Wall.	=	Aspidium bullatiferum	=	Presl.
Aspidium bullatum	... Bl.	=	Dipteris Beddomei	=	Bl.
Dipteris Wallichii	... Presl.	=	Dictyopteris difformis	=	Presl.
Dictyopteris irregularis	... Don.	=	Goniophlebium persicifolium	=	Don.
Goniophlebium amplissimum	... Hook.	=	Cibotium Baromets	=	Kze.
Cibotium glaucum	... Moore	=	Aspidium multidentatum	=	Wall.
Aspidium Hookeri	... Don	=	Microlepia marginalis	=	Hook.
Microlepia scabra	... Hook.	=	Davallia divaricata	=	H.
Davallia polyantha	... Wall.	=	Lastrea cuspidata	=	Mett.
Polypodium scrupatum	... Wall.	=	Nephrodium nigrosum	=	Bor.
Nephrodium sanctum	... Thw.	=	Nephrolepis truncatula	=	Presl.
Nephrolepis exaltata	... Hook.	=	Selliguea effusa	=	Hook.
Selliguea decurrens	... J. Sm.	=	Sagenia cultrata	=	Kze.
Dryopteris Beddomei	... Hook.	=	Polypodium Beddomei	=	H.
Polypodium Beddomei	... Hook.	=	Blechnum divaricatum	=	Sw.
Blechnum serrulatum	... J. Sm.	=	Trichomanes emarginatum	=	Bl.
Trichomanes flaccidum	... Bedd. ex Hook.	=	Trichomanes Motleyi	=	Van den Bosch.
Trichomanes Beddomei	... Griff.	=	Kaulfussia caudiformis	=	Bl.
Kaulfussia Assamica	... Hook.	=	Aspidium parallelum	=	Bl.
Aspidium caudatum	... Bedd.	=	Lastrea ornithopa	=	Hook.
Lastrea leptosphlebia	... Beddl.	=	Pleocnemia trabeculosa	=	Presl.
Pleocnemia Griffithii	... Parish.	=	Nephrolepis cordifolia	=	Desv.
Nephrolepis Duthiana	... Hook.	=	Lastrea sagenioides	=	Mett.
Polypodium obscurum	... Hook.	=	Nephrolepis Meeboldiana	=	Bedd.
Dennstaedtia Beddomeana	... Bedd.	=	Cystopteris setosa	=	Bedd.
Lastrea setosa	... Beddl.	=	Trichomanes nahum	=	Van den Bosch.
Trichomanes Kaulfussi					

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CORRECTIONS

IN THE

NOMENCLATURE OF FERNS OF SOUTHERN INDIA.

For.		Read.
Trichomanes Finlaia	Linn. = Trichomanes pyxidiferum	
Schizoloma recurvatum ...	Moore. = Schizoloma ensifolium	
Antrophyum reticulatum ...	Kaulf. = Antrophyum plantagineum	
Bolbytenium subcaudatum ...	Wall. = Bolbytenium dimorphum	
Odontosoma parvifolium ...	L. = Odontosoma pinnatum	
Prosaptia cyathoides ...	Don. = Schizopteris barbata	
Nephrodium abruptum ...	Presl. = Nephrodium pentagonum	
Nephrolepis ferruginea ...	J. Sm. = Nephrolepis pteroides	
Olfersia retusiuscula ...	Cav. = Olfersia fraxinifolia	
Nephrolepis tuberosa ...	Presl. = Nephrolepis cordifolia	
Lastrea cataractæ ...	Don. = Lastrea ciliata	
Lastrea rivularis ...	Hook. = Lastrea Beddomei	
Lastrea flexuosa ...	Hook. = Lastrea setigera	
Lastrea subhastata—β stylodes	Kze. = Lastrea stylodes	
Lastrea spectabilis ...	J. Sm. = Lastrea syrmatica	
Lastrea gracilescens ...	Hook. = Lastrea Beddomei	
Lastrea intermedia ...	Beddl. = Lastrea ciliata—very montana	
Aspidium multijugum ...	Wall. = Aspidium subrotale	
...ocarpum ...	Fedd. = Aspidium cruciatum	
...ptentrionale ...	Wall. = Aspidium sagittifolium	
...olypodioides ...	Bl. = Dryopteris setosum	
...n parvulum ...	Moore. = Dryopteris rupestre	
...n nigrocarpum ...	Beddl. = Lastrea scabrosa	
...apicale ...	Wall. = Pleopeltis lepidota	
...a tridactyla ...	Wall. = Pleopeltis pteropus—var. minor	
...a Wightiana ...	Wall. = Pleopeltis floccata	
...ale lepidota ...	Wall. = Pleopeltis lanceolata	
...olus porosus ...	Wall. = Niphobolus fungi	
...abulus nummularifolius ...	Mett. = Dictymoglossum plicatulum—very	
...opteris repanda ...	J. Sm. = Pteridopteris contaminans	
...enium spatulatum ...	J. Sm. = Asplenium affine	
...podium Walkeræ ...	Hook. = Lastrea Walkeræ	
...agenta gigantea minor ...	Hook. = Sagenia monobrencoa	
...strea acuminata ...	Thw. = Lastrea Thwaitesii	
...astrea Blumei ...	Hook. = Lastrea intermedia	
Nephrolepis obliterata ...	Hook. = Nephrolepis pinnata	
Microlepia proxima ...	H. = Microlepia Thwaitesii	
Trichomanes glauco-fuscum ...	Hook. = Trichomanes pallidum	
Hymenophyllum polyanthos ...	Ser. = Hymenophyllum chæroum	

INDEX OF ALL THE SPECIES FIGURED IN "THE FERNS OF SOUTHERN INDIA" AND IN "THE FERNS OF BRITISH INDIA"

F+1.33

POLYPODIEÆ.

* Veins free.

NOTHOCHLÆNA. *R. Brown Prod. Fl. N. Holl.* 135.

(Gymnogramme, *Desvaux*;—Argyrochosma, *J. Smith*;—Leptochilus, *J. Smith*;—Leptogramma, *J. Smith*.)

Gen. char. Sori naked, linear, small, rotundate or oblong-linear, continuous, becoming laterally confluent into a marginal line from which the veins terminate. Veins simple or forked from a central costa. Fronds free.

Fronds pedate, lobed, or pinnate; the margins sometimes with a cartilaginous border. Veins free. Sori marginal, or parallel to the margin, continuous, or confluent laterally. (Above.)

1. NOTHOCHLÆNA MARANTÆ. Br.) Caudex short, thick, fibrous. Fronds densely pulverulent with soft white farina, ovate-deltoid, pedate-pinnate, 3-5 inches long, 2-3 inches broad; pinnæ 3-5, the terminal one largest, sessile, ovate-deltoid, acute, pinnatifid, the lobes linear-oblong, obtuse, the lateral ones 4-5-10 inches long, 2-3 inches wide, oblong-lanceolate, acuminate, cuneate at base, glabrous above, white-farinose beneath; lobes oblong-lanceolate, subfalcate, obtuse, entire, or sinuate-crenate, glabrous above, white-farinose beneath; veins simple or forked, primary pinnæ petiolate or sessile from a broadish oblong base, pinnules not united or approached by wide 2-4 lines long, very narrow sinus, oblong, obtuse, entire, or sinuate-crenate, primary pinnæ) the edge scarcely reflexed, not forming a broad border, extending some way from the margin the whole of the fertile surface covered by the pulverulent covering.—*Hook. Sp. Fil.* v. 120;—*Br. Prod. Fl. N. Holl.* p. 148;—*Desv. Journ. Bot.* v. 4. 253;—*N. subcordata, Desv.*;—*Acrostichum Marantæ, Linn. Sp. Pl.* p. 1537;—*Sw. Syn. Fil.* p. 71;—*Willd. Sp. Pl.* v. 5. p. 125;—*Schk. Fil. Gr.* t. 101;—*Osbeck, Dz Cant.*;—*Hypogramme, Presl.*;—*L. Gaudichaud, Freyc. Voy.* t. 93.

The specimen figured is from near Sfax.

Hab. South of Europe, N. Africa and adjacent islands, Abyssinia, S. W. Asia, Himalaya, Kumaon.

PLATE No. 1.

74.2.33

7 X . K . 33

POLYPODIUM. (See Ferns of S. India, p. 54.)

1. **Polypodium trichomanoides** (Sw.) Caudex short erect palæaceous above densely rooting with wiry [illegible] short, ¾-1 inch long, densely tufted, patent-villous with long fibrous hairs, fronds 3-4 inches to a span long, 2-4 [illegible] membranaceous, linear, attenuated at both extremities, deeply nearly to the costa pinnatifid or almost pinnate, (quite so [illegible] lobes horizontally patent from a broad base, ovate or oblong entire, sub-concave beneath, sub-decidumly ciliated with [illegible] [illegible]ckish patent hairs, veins solitary in each lobe, simple or forked, each lobe having a single sorus near the costa.—*Hook.* [illegible] 78;—*Sw. Syn. Fil.* p. 184;—P. ribbonum, *Fée*;—P. Serricula, *Fée*;—P. nanum, *Fée*;—P. serrulatioides, *J. Sm.* [illegible] *of Bot.* iii. 394.

The specimen figured is from the Sikkim Himalaya. (Dr. Thomson.)

Habit. Tropical America from Brazil and Guiana to the Pacific, and the Islands.—Malacca, Lachen, Sikkim.—Himalaya [illegible] of Ascension.

PLATE No. II.

GONIOPTERIS. (See Ferns of S. India, p. 57.)

1. GONIOPTERIS LINEATA (Coleb.) Stipes 1½ foot and more long rather stout, scaleless, glossy, and as well [illegible] strongly tinged with red (rarely stramineous) fronds 1-2-3 feet long, broad-oblong or lanceolate, coriaceous-subcoriaceous [illegible] glabrous, pinnæ numerous rather distant patent sessile 5-8 inches long, ½ an inch or little more broad (on sterile [illegible] exceeding an inch) from an obliquely cuneate-truncate sessile base, (lower ones rather more attenuated and subpetiolate [illegible] cuneato-oblong, finely acuminated at the apex, the margin coarsely and sharply submucronate-serrated, serratures [illegible] [illegible] uniform, coeloe prominent beneath of the same colour as the rachis and stipes generally reddish, veinless about [illegible] [illegible] [illegible], of which all are connivent except 2-3 short pairs in the teeth of the serratures, rori in 2 series on the middle of the [illegible] [illegible] *Sp. Fil.* v. 12;—*Colebr. in Herb. Wall., and Wall. Cat.* n. 300;—P. costatum, *Wall. Herb.* (not Goniopteris costata of [illegible]

The specimen figured is from Birmah (Captain the Honorable J. Dormer.)

Hab. Nepaul, Kumaon, Simla, Nimhlow, Silhet, Mishmee, Ceylon!

PLATE No. III.

POLYPODIEÆ.

Veins reticulated without free included veinlets.

DICTYOPTERIS. *Presl. Tent. Pteridol.* 194.

[illegible] *Smith.*—Polypodii sp., *Auct.*—Dryanariæ sp., *Fic.*—Aspidii sp., *Blume.*—Phlegopteridis sp., *Mettenius.*)

[illegible] *Sori* non-indusiate, globose or oblong, compital, i. e., the *receptacles* uniting several radiating reticulated veinlets, [illegible] uniformly reticulated (or sub-pinnately branched) from a central coste, the areolæ elongated, oblong, without free [illegible]

[illegible] coriaceous or sub-coriaceous, simple or bi-pinnate. Sori sometimes marginally serial. Rhizome creeping (? always).

[illegible] *sinuous venation, without included free veinlets, distinguishes this genus.* (Moore.)

DICTYOPTERIS TENERIFRONS (Hook.) Caudex small creeping underground scaleless with very few radicles, [illegible] remote slender glossy, stramineous, the base very tumentose with a few sparse scales partly subterraneous, attached to the caudex by a small point, trouble thin, membranaceous pale-green, glabrous subpubernlous on the veins, 6-9 inches long, quite as broad as long, [illegible] or pinnated with 3-9 sub-falcate pinnæ, lateral ones nearly opposite petiolate lowest pair half-ovate, [illegible] 4-8 inches long, lobato-pinnatifid, those of the superior margin with broad ovate nearly equal subdenticulate, blunt lobes, the inferior ones much elongated and acuminated, the basal ones again lobato-pinnatifid, intermediate pinnæ ovato-lanceolate pinnatifid [illegible] pinnæ long petiolate broad-ovate acuminate deeply pinnatifid especially at the base, veinlets uniformly reticulated, areolæ with no includial free veinlets, cranular areolæ large, sori rather irregularly scattered, dorsal or compital. *Hook. Sp. Fil.* v. 104.

The specimen figured is from Moulmein (Rev. C. S. P. Parish).

Hab. W. Trop. Africa, Luzon, Moulmein.

PLATE No. IV

POLYPODIEÆ.

* * * *Veins reticulated with free included veinlets.*

† *Free veinlets excurrent.*

GONIOPHLEBIUM. *Blume, Fl. Jav.* 132.

(Marginaria, *Presl.* (non-*Bory.*).—Synammis, *Presl.* in part;—Pleurogonium, *Presl.*,—Lepicystis, *J. Smith* in part;—Lepho[illegible] *J. Smith*.—Schellolepis, *J. Smith*.—Crypsinus, *Presl.*;—Crespedaria, *Link in part*: *Fée*;—Polypodii sp., *Auct.*,—Grammitidi[illegible] *Lamoux*.—Campylopsori sp., *Auct.*—Acrostichi sp., *Langsdorff et Fischer*.—Merosori sp., *Klotzsch*.)

Gen. char. *Sori* non indusiate, globose (rarely oblong); the *receptacles* punctiform (rarely oblong,) situated at the apex of lower anterior venules, or of the simple excurrent free veinlets, one being included within each areole. *Veins* forked or pinnate fr[illegible] central costa; the lower anterior venules usually free and fertile, the rest angularly or somately anastomosing (in one or more, frequ[illegible] several series), and producing from their angles free excurrent *veinlets* which are often fertile; the marginal veinlets free.

Fronds simple, pinnatifid, or pinnate, herbaceous or coriaceous, sometimes scaly, the fertile often much narrower. Sori [illegible] variously uni-bi-tri-serial, sometimes equaniferous; Rhizome creeping, the fronds articulated. (Moore).

1. GONIOPHLEBIUM AMÆNUM (Wall.) Caudex creeping, densely paleaceous, with ferruginous subulate scales, [illegible] a span to a foot or more long, stramineous or brown, fronds 1 to nearly 2 feet long, 6-10 inches wide, glabrous or sub-pubescent [illegible] terminating in a lanceolate acuminate sub-entire segment, deeply pinnatifid to within 2-3 lines of the costa, segments horizontal [illegible] less approximate 3-6-8 inches long, ¼-½ an inch wide, sub-falcate from a broad base, coriaceous gradually acuminate, entire, or [illegible] dentate serrate, lowest pair deflexed, veins forming one costal series of moderately sized soriferous areoles, and sometimes two (the [illegible] not soriferous), marginal veinlets free, soriferous veinlet always arising from the vein at a distance from the costa, sori subglobose [illegible] (papillose on the upper side.)—*Hook. Sp. Fil.* v. 24;—*Wall. Cat.* n. 290;—*Metten. Polyp.* p. 80;—Marginaria, *Pr.*—Goniophl[illegible] *J. Sm.*

The specimen figured is from Dalhousie (Captain Dyas).

Hab. Nepaul, Khasya, Bhotan, Kumaon (alt. 5,000 to 10,000 feet), Mussoorie, Dalhousie.

PLATE No. V.

GONIOPHLEBIUM ARGUTUM (Wall.) Caudex thick as a writing-quill, squarrose with subulate, blackish or brown glossy scales, stipites 3-4 inches to a span long, testaceous-brown, glossy, fronds firm-membranaceous, glabrous, 1-2 feet long, 8-10 inches broad, pinnated, pinnæ distant, sub-horizontally patent, 4-6 inches long, ½-¾ inch wide from a broader, but obtusely and obliquely truncate or sub-truncated base (rarely rotundate-auricled), elongato-oblong, acuminate, rather obtusely serrated, lower ones often opposite, the rest alternate, superior ones more or less adnate and decurrent, terminal one similar to the rest, veins forming a costal series of large oblong areolæ, marginal veins ending in a thickened apex within the margin all free, semi-orbicular, superficial at the apex of the [illegible] veins in the costal areoles. *Hook. Sp. Fil. v.* 32. *Wall. Cat.* n. 508.

The specimen figured is from Nyncs Tal (Mr. Oldham.)

Hab. Nepaul, Kumaon, Nynes Tal, Sikkim, Khasya, Gowhatty Plains.

PLATE No. VI.

Goniophlebium

PLEOPELTIS. (See Ferns of Southern India, p. 57.

1. PLEOPELTIS LONGIFOLIA (Metten.) Caudex horizontal, creeping, thick squamose, stipites approximate, 2-3 inches long, fronds 1-2-3 feet long, ¾-1¼ inch wide, thick, carnoso-coriaceous, glabrous, linear-lanceolate, obtusely acuminate, gradually long-attenuated below on the stipes, entire, the margins sub-revolute, venation internal, very indistinct, costules veniform united by transverse veins both rather large areoles then into irregular lesser ones, which include free veinlets, sori compital oblong, forming a line or series near the margin rather close-placed, sunk into the substance of the frond, and forming a corresponding elevated line on the upper surface, capsules mixed with long stipitate scales.—*Hook. Sp. Fil.* v. 60—*Metten. Polyp.* p. 87;—Grammitis longifolia, *Bl. Ex. Fil. Jav.* p. 119, and Pleopeltis *Add.*, and Gr. decurrens and Pleopeltis decurrens, *Bl. ll. cc.*;—Polyp. contiguum, *Wall.* n. 285;—*Hook. Ic. Pl.* v. t. 987; *Cat.* 6 *Ferns* t. 87), *Fil. Exot.* t. 20;—Phymatodes and Drynaria revoluta, *J. Sm.*;—Paragramma, *Blume and Meyer Ind. Fil.* xxxii.

Mr. Moore adopts Blume's former name and places this fern amongst the Tænitidæ, with which it certainly has some affinity.

The specimen figured is from Moulmein (Rev. C. S. P. Parrish).

Hab. Malay Islands and Peninsula, Java, Birmah, Luzon, Singapore, Mergui.

PLATE No. VII.

Pleopeltis longifolia
(Martius)

PLEOPELTIS SINUOSA (Wall.) Caudex much branched, long-creeping or scandent on trees, sparingly radiculose, [illegible] inches thick, almost woody when dry, probably carnose when recent studded, as it were, with large conical processes upon which [illegible] have been articulated, and which appear to increase much in size after the fronds have fallen, the whole densely covered [illegible] with nearly orbicular appressed whitish peltate scales with a dark spot in the centre, stipites 1-2 inches long; [illegible] fronds sub-dimorphous, sub-coriaceo-membranaceous, glabrous; *sterile* ones 3-6-7 inches long, ½-1 inch broad, [illegible] long-stalked, entire; *fertile* ones longer, sometimes a foot-16 inches long, ½-¾ of an inch wide, linear-elongato-oblong obtuse, the [illegible] more or less sinuated, the base in both attenuato-decurrent, venation copious, anastomosing, forming large very irregular areoles [illegible] areas (formed by more slender veins), and these include branched or simple veinlets which occasionally again anastomose [illegible] oblong, immersed in a cavity which forms pustules on the upper side arranged in a single series nearer the margin than [illegible] — *Hook. Sp. Fil. v. 64.* — *Wall. Cat. n* 2231.

The figure is taken from Sir W. Hooker's Icones Filicum.

Hab. Straits of Malacca, Amboyna, Isle of Jobi, New Hebrides, Java, Mergui, Birmah.

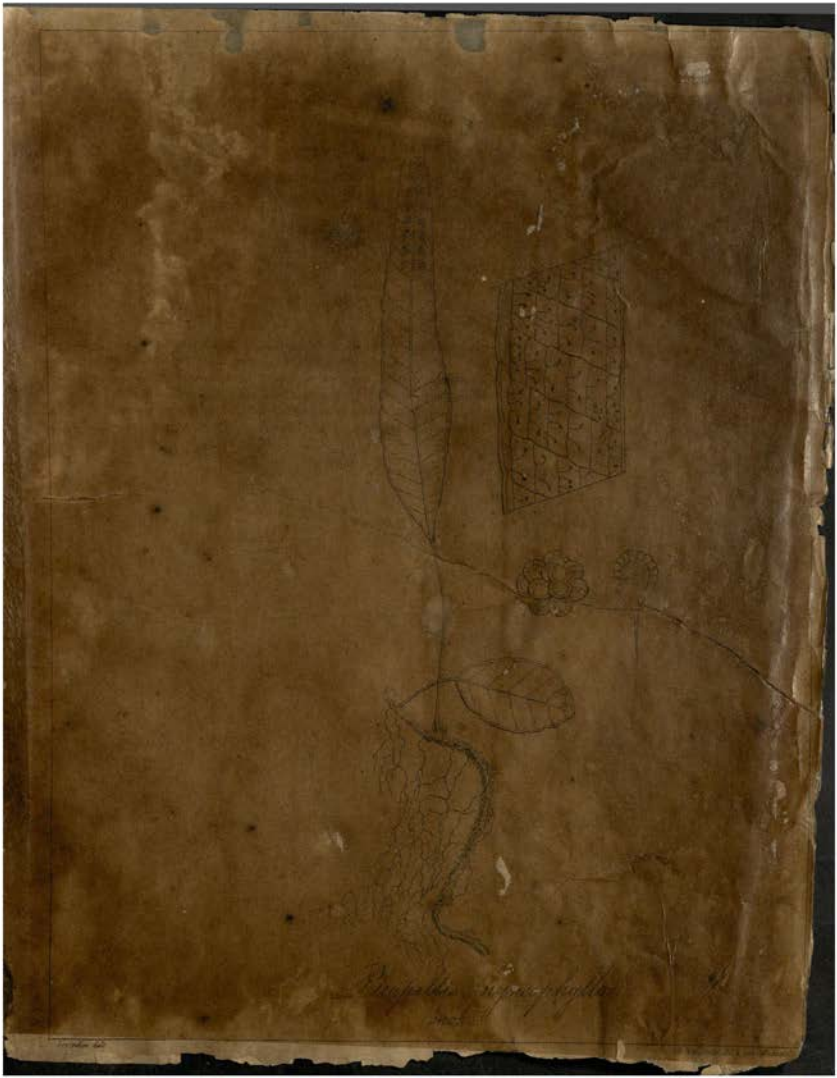
PLATE No. VIII.

PLEOPELTIS RHYNCOPHYLLA (Hook.) Caudex creeping, slender, paleaceous, sub-squarrose with subulate ferruginous [illegible] slender, 1-2 inches long of the *sterile* frond, 2-4 of the *fertile* one, fronds firm, chartaceo-membranaceous, glossy, [illegible] thickened, remotely [illegible]; *sterile* ones 1-2 inches long, elliptical, or sub-ovate, obtuse; *fertile* ones 3-6 inches long, lanceolate [illegible] gradually and long-acuminated, below cuneato-attenuated, venation distinct, slightly prominent, the costules are [illegible] transverse veins forming areoles which enclose free veinlets which latter sometimes unite with opposite veins, the sori are [illegible] to the narrow acuminated apex and when mature are very large in a single series on each side of the costa.—*Hook. Sp. Fil. v. 65.—Hook. Ic. Plant. 955 (or t. 95 of Cent. of Ferns).*

The specimen figured is from Birmah (Rev. C. S. P. Parish).

Hab. Assam, Khasya, (alt. 4,000 feet), Birmah.

PLATE No. IX.



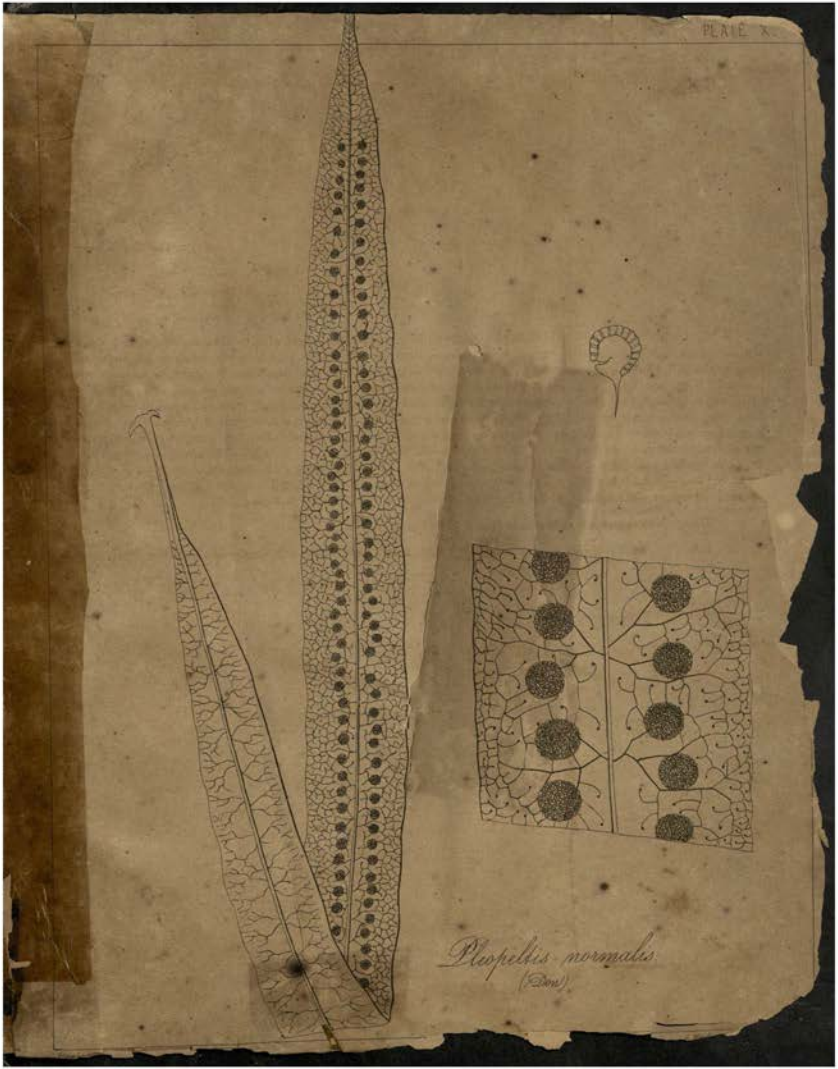
PTEROPHYLLITIS NORMALIS (Don.) Caudex very long, creeping or scandent, often as thick as a writing-pen, the young parts clothed with black subulate setaceous squarrose scales, in age perfectly smooth, stipites very numerous on the caudex, more or less approximate, 1-2 inches long, as well as the costa reddish straminous, fronds firm-membranaceous, glabrous, varying extremely in size, 1-2 feet or more long, ½ of an inch to 2 inches wide, lanceolate or elongato-lanceolate or loriform, generally long and finely acuminate, usually attenuated and decurrent at the base, entire sub-falcate or flexuose; venation slightly prominent especially beneath, costules forming rather large but very irregular areoles with free included veinlets, sori mostly compital, rather large, arranged in a single series nearer the costa than to the margin or in a waved line partially scattered or very copious, and irregularly dispersed over the whole under surface of the frond.—*Hook. Sp. Fil.* v. 69;—*Metten. Polyp. p.* 86, *t.* 1, *f.* 41-43.—Var. *α, normalis;* frond 1-1½ feet long, ½ an inch to 1 inch wide;—Polypod. normale, *Don. Prodr. Nep. p.* 1;—Phymatodes, *Pr.*;—Drynaria, *J. Sm.*;—Var. *β, latifrons;* fronds 2-3 feet long, 1-2 inches wide, sori regularly uniserial;—Var. *γ, sparisora;* fronds 2-3 feet long, ½-1 inch wide, sori irregularly scattered and copious.—P. longifrons, *Wall. Cat. n.* 274;—*Hook. and Grev. Ic. Fil t.* 65;—Drynaria, *Fée.*

The specimen figured is from Moulmein (Rev. C. S. P. Parish).

Hab. Var. *α* and *γ*, Nepaul, Khasya, Assam (alt. 4-6,000 feet). Var. *β* Malacca, Moulmein, (alt. 4,000 feet), China, Formosa.

PLATE No. X.

PLATE X.



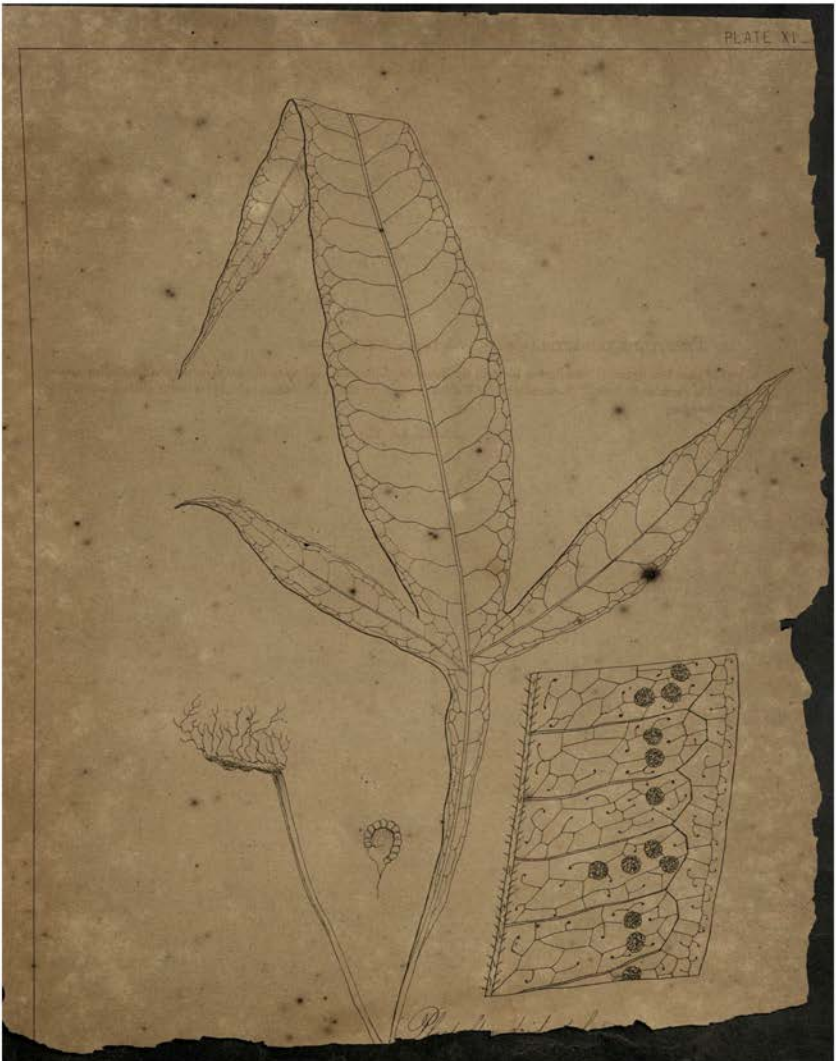
Pleopeltis normalis
(Don).

5. PLEOPELTIS TRIDACTYLA (Wall.) [Vide Ferns of S. India, p. 60].

The plant here figured is from Birmah (Captain the Honorable J. Dormer), and seems distinct from the small S. Indian species figured in "*The Ferns of S. India*." It is undoubtedly Wallich's species, so that the S. Indian and Ceylon fern if distinct will have to receive another name.

PLATE No. XI.

PLATE XI

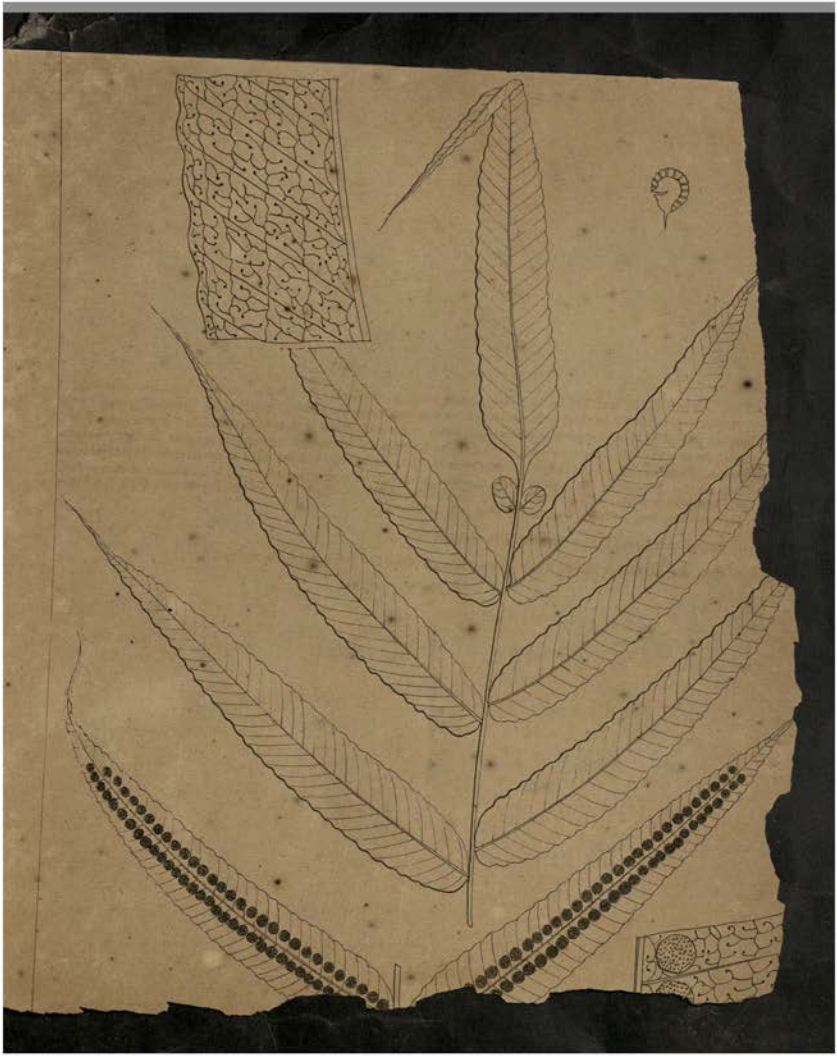


6. PLEOPELTIS CAPITELLATA (Wall.) Caudex creeping, furnished with hair-like ovate or lanceolate scales, stipites 1 foot and more long, fronds 1-2 feet long, membranaceous or coriacco-membranaceous, glabrous, ovato-oblong, pinnated, (young fronds often simple,) pinnæ 1 to 21 pairs opposite or alternate articulated on the rachis, sessile or more or less petiolate, 5-9 inches long, ½ to 2 inches broad, obtuse at the base, finely acuminated at the apex, (often with a distinct membranaceous margin,) entire or slightly sinuato-lobate-costules, straight extending to the margin, these are connected by transverse veins with 3-4 series of areoles again divided into lesser areoles including free divaricating veinlets, sori large, superficial in a single series near the costa or 1-2 in the primary areoles.—*Wall. Cat.* 306, Phymatodes capillata ;—*Hook. Sp. Fil.* v. 90 ;—Phymatodes tennicauda, *Hook. l. c.* ;—Phy. Himalayensis, *Hook. l. c.* 91 ;—Polyp. juglandifolium, *Don.* ;—Polyp. venustum, *Wall. c.* 305 (not Desv.)

The specimen figured is from Nynee Tal (Mr. Oldham.)

Hab. Nepaul, Bhotan, Sikkim, Khasya, Assam, Kumaon (7,000 ft.), Srinuggur, Simla, Nynee Tal.

PLATE No. XII.



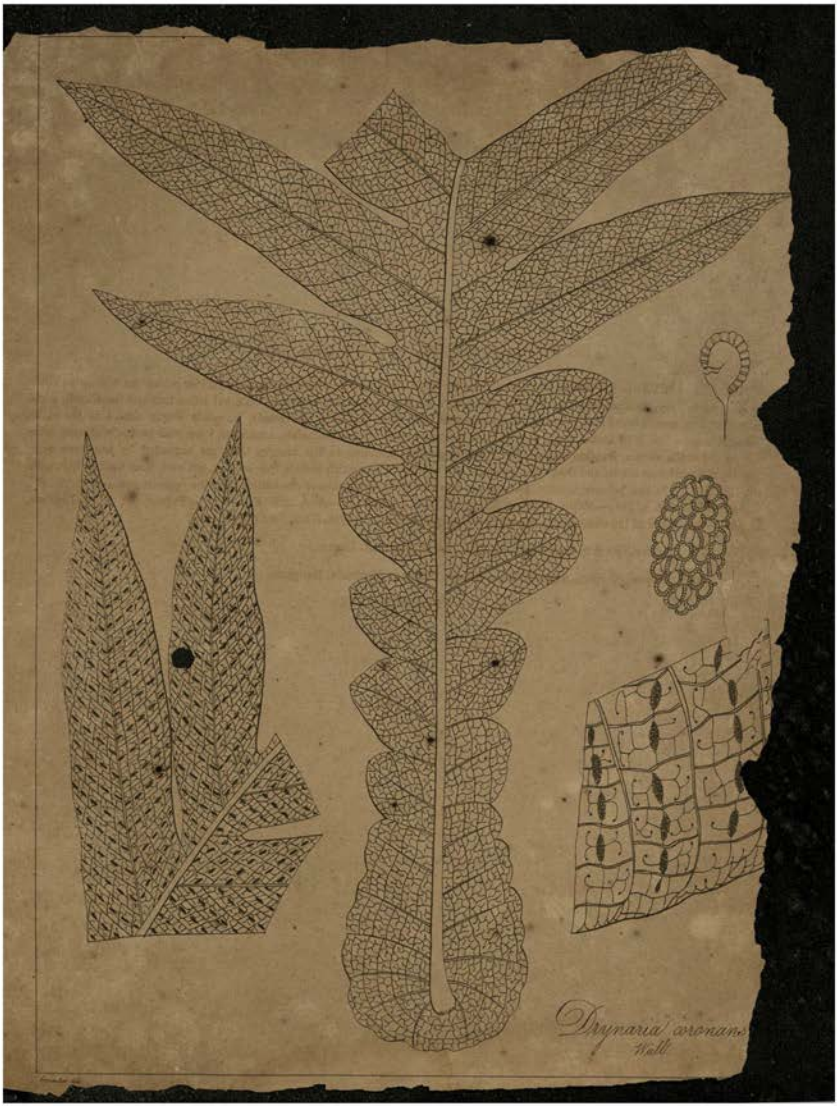
DRYNARIA. (See Ferns of S. India, p. 63.)

1. DRYNARIA CORONANS (Wall.) Caudex thick, creeping, branched and interwoven, villoso-paleaceous with aureo-nitet scales, fronds large, uniform when growing arranged in a circle, firm, coriaceo-membranaceous, but rather thin and translucent, 2 an more feet long, from a broad sessile cordate, lobato-pinnatifid base, (then suddenly contracted), lanceolate deeply almost to the rachi pinnatifid, segments 8-12 inches long, $\frac{3}{4}$ to 1 inch and more wide, oblongo-lanceolate, acuminate, lower ones gradually shorter, entire incrassated at the margin, venation very manifest, costules parallel extending to the margin, these are connected by transverse veins forming 5-6 soriferous areoles and then again generally two or three others which include free veinlets, sori oval, often confluent, longitu dinally, solitary in the primary areoles, forming an excentric series always nearer one costule than the opposite one.—*Hook. Sp. Fil.* v. 94 ;—*Wall. Cat. n.* 288 ;—*Metten. Polyp. p.* 121 *t.* 40, 41, *(venation)* ;—*Hook. Fil. Exot. t.* 91 ;—Phymatodes, *Pr.* ;—Drynaria *J Sm.* ;—Var. *β* sori of the series confluent ;—Polyp. contiguum, *Wall. in Herb. Hook. (not Cat. n.* 285.*)*

The specimen figured is from Moulmein (Capt. the Honorable J. Dormer.)

Hab. Nepaul, Kumaon, Assam, Sikkim, Khasya, Mishmee, Moulmein, Hongkong.

PLATE No. XIII.


Drynaria coronans
Wall.

PERANEMEÆ.

WOODSIA. *R. Brown, Trans. Lin. Soc.* xi. 173 *t.* ii.

(Physematium, *Kaulfuss*;—Hymenocystis, *C. A. Meyer*;—Hymenolæna, *C. A. Meyer*;—Perrinia, *Hooker*;—Polypodii sp., *Auct.*;—Aspidii sp., *Auct.*;—Alsophilæ sp., *Auct.*;—Dicksoniæ sp., *Auct.*;—Cystopteridæ sp., *Auct.*;—Lastreæ sp., *Presl.*;—Acrostichi sp., *Auct.*,—Ceterachis sp., *Auct.*;—Nothochlænæ sp., *Desvaux.*)

Gen. Char. *Sori* involucrate, *i. e.*, with inferior indusia, globose; the *receptacles* medial or terminal. *Involucre* soft, membranaceous, pateriform and fimbriately crinite, or calyciform with the margin lobed, or sub-globose with a contracted mouth. *Veins* simple, forked or pinnate, from a central costa; *venules* free.

Fronds membranaceo-herbaceous, small, pinnate, pinnato-pinnatifid or bi-pinnate. Rhizome tufted, erect or decumbent. A very well-marked group, distinguished by the involucriform nature of the indusium, the sessile sori, and free veins. (Moore.)

1. WOODSIA ELONGATA (Hook.) Glanduloso-pilose especially above, fronds oblong, elongate, pinnated, pinnæ rather distant, alternate sessile from a broadish base, oblong-obtuse, pinnatifid about ½ way down, segments short rounded inciso-dentate, each bearing a sorus (rarely more) near the sinus, involucres small, soon bursting with an irregular opening at the top, glanduloso-pilose, stipes and rachis slightly chaffy.

The specimen figured is from the Himalayas (Dr. Thomson.)

Hab. Himalayas, Krande.

PLATE No. XIV.

DIDYMOCHLÆNEÆ.

DIDYMOCHLÆNA. *Desvaux Berl. Mag.* v. 303 *t.* 7 *fig.* 6.

(Monochlæna, *Gaudichaud ;*—Hippodium, *Gaudichaud ms. ;*—Ceramium, *Reinwardt ;*—Tegularia, *Reinwardt ;*—Hysterocarpus, *Langsdorff M.S. ;*—Diplazii sp., *Raddi. ;*—Aspidii sp., *Auct. ;*—Asplenii sp., *Auct. ;*—Adianti sp., *Auct.)*

Gen. char. *Sori* indusiate, elliptic-oblong ; the *receptacles* oblong, dorsal at the apex of the venules. *Indusium* of the same form, obtuse at both ends, attached longitudinally along its centre to a crest formed elevation of the receptacle, free at the margins. *Veins* flabellately-forked ; *venules* direct, free ; the anterior one in each fascicle soriferous, the sterile ones clavate at the apex.

Fronds bi-pinnate, coriaceous ; pinnules dimidiate or sub-dimidiate, obtuse, articulated, sub-ecostate. Rhizome arborescent. Handsome tree ferns, with peculiar fructifications. (Moore.)

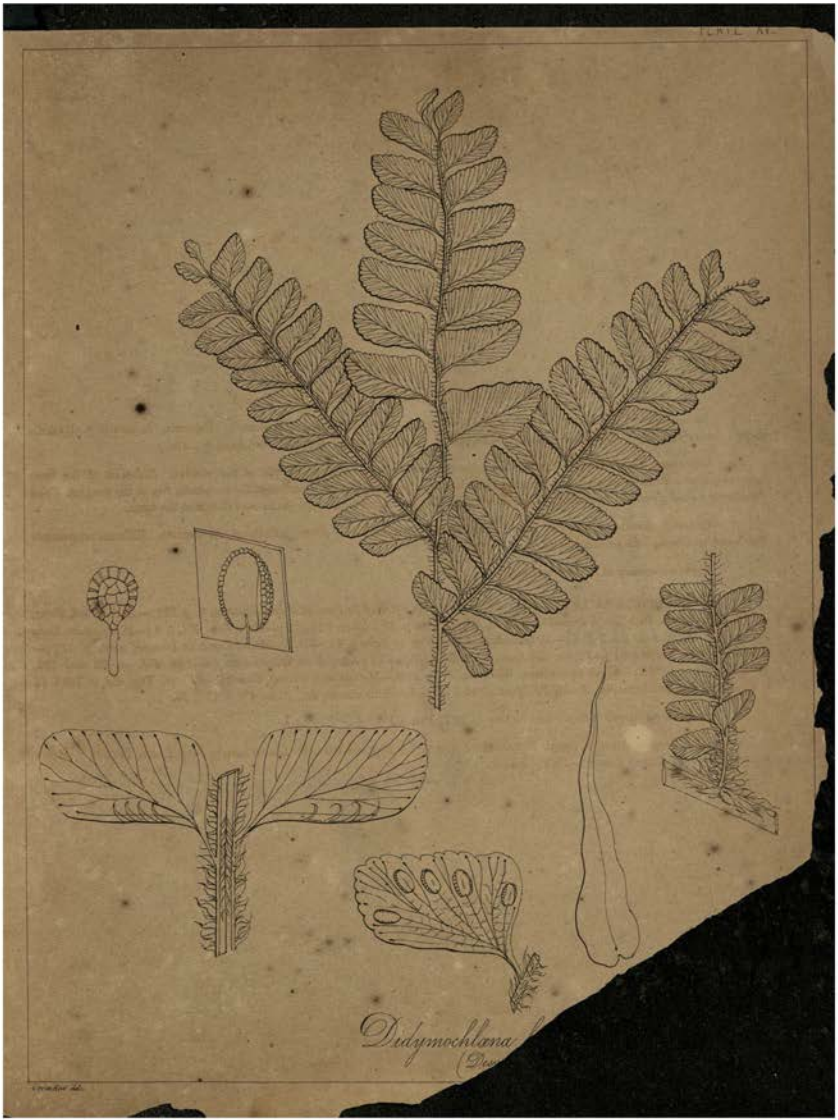
Agenus consisting of a single species.

DIDYMOCHLÆNA LUNULATA (Desv.) *Hook. Sp. Fil.* iv. 5 ;—*Desv. in Mem. Soc. Linn.* vi. *p.* 282 ;—*Hook. Gard. Ferns. pl.* 17 ;—D. sinuosa, *Desv. l. c. p.* 28 ;—*Mart. Ic. Pl. Crypt. Bras. p.* 95 *t.* 28 *and* 29 *f.* 1 ;—*Hook. Gen. Fil. t.* 8 ;—D. squamata, *Desv. Journ. Bot. Appl.* 1 *p.* 5 *t.* 2 *f.* 4 ;—D. truncatula, *J. Sm. Gen. of Ferns p.* 84 ;—D. dimidiata, *Kunze. in Linnæa,* xviii. *p.* 122 ;—*Schk. Fil. Suppl. p.* 200 *t.* 84 ;—*Pappe. and Raws. Syn. Fil. Afr. p.* 15 ;—Aspidium truncatulum, *Sw. Syn. Fil. pp.* 52 *and* 252. *Willd. Sp. Pl.* v. *p.* 256 ;—Aspid. squamatum, *Willd. Sp. Pl.* v. 250 ;—Monochlæna sinuosa, *Gaudich. in Freyc. Voy. Bot. p.* 340 *t.* 12 *f.* 3 ;—Diplazium pulcherrimum, *Raddi Fil. Bras. p.* 42 *t.* 59 ;—Lonchitis ramosa, &c., *Plum. Fil. p.* 43 *t.* 56.

The specimen figured is from Birmah (Rev. C. S. P. Parish.)

Hab. Tropical America, Brazil, N. Granada, Andes of Ecuador and Peru, W. Indian Islands, Java, Luzon, Birmah, S. Africa, Natal, Madagascar, Part of Fernando-Po-Fiji Islands.

PLATE No. XV.


Didymochlana

ADIANTEÆ.

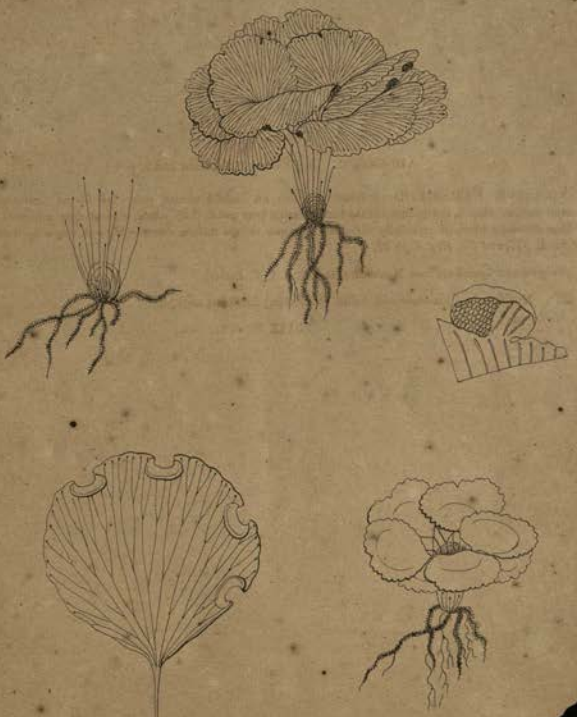
ADIANTUM. (See Ferns of Southern India, p. 1.)

ADIANTUM PARISHII (Hook.) Small cæspitose no distinct caudex, roots few fibrous tomentose, fronds flabellate membraneous pellucid, sterile ones crenato-dentate, fertile ones pauci (3-5) lobate, sinuses deep soriferous, veins or from the base flabellato-divergent repeatedly dichotomous, stipes slender filiform ebeneous-black shining articulated at the sum *Hook. Sp. Fil.* ii. 237, *and Fil. Exot.* i. *pl.* 51.

The specimens figured are from Moulmein (The Rev. C. S. P. Parish).

Hab. Moulmein on a limestone rock (called Twa-Kabin,) 2,000 feet elevation.

PLATE No. XVI.



Adiantum Parishii
(Hook)

ADIANTEÆ.

ADIANTUM EDGEWORTHII. (Hook.) Everywhere glabrous, fronds linear-oblong elongated attenuated and [illegible] at the apex and there bare of pinnæ, pinnæ nearly sessile alternate dimidiato-oblong rather acute, the upper base truncated with the rachis, superior margin obscurely lobed rather more so in the sterile pinnæ, indistinct lobes truncated and bearing the on each lobe, sori oblong elongated approximate, stipes elongated slender and as well as the rachis ebeneous glabrous.—*Fil.* ii. 14.

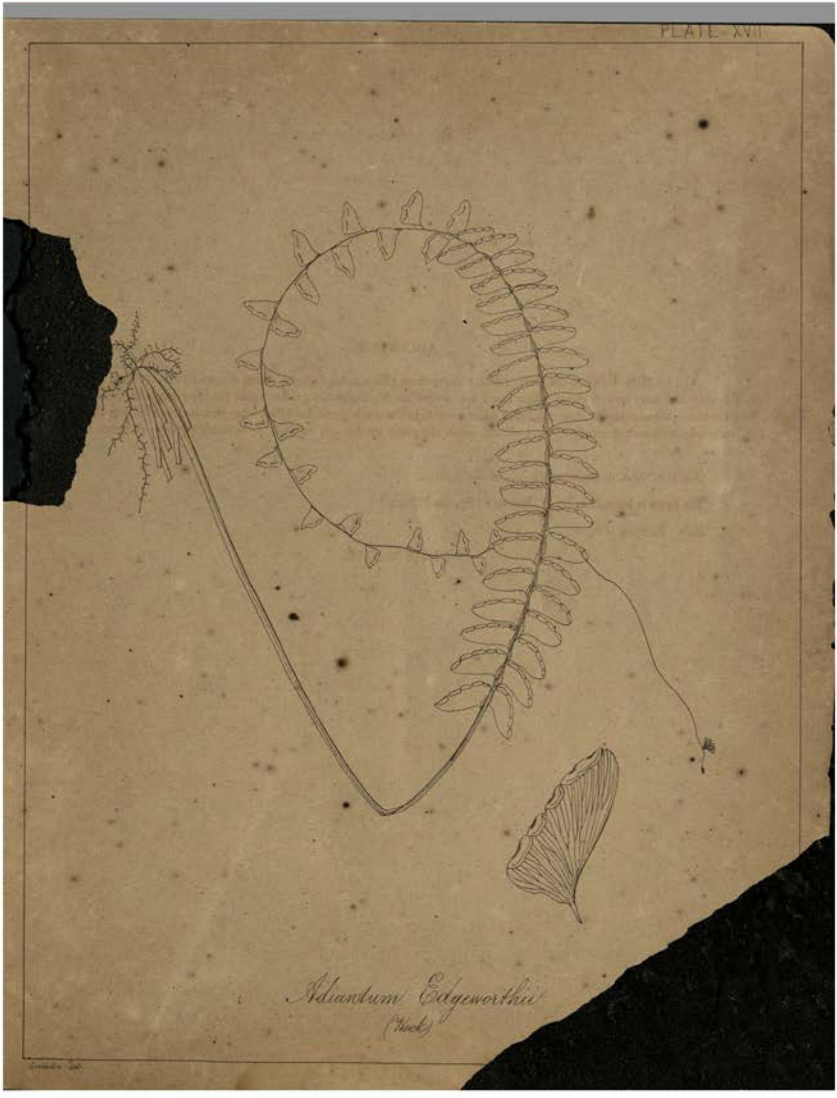
Nearly allied to A. caudatum but pinnæ nearly entire.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Mooltan, (Punjab.)

PLATE No. XVII.

PLATE XVII



Adiantum Edgeworthii
(Hook)

ADIANTEÆ.

ADIANTUM EMARGINATUM (Bory.) Fronds bi-tri-pinnate, pinnules obcordato-cuneate, sterile ones serrul apex, sori oblong.—*Willd.*—*Bory. in Willd. Sp. Pl.* v. 449 ;—*Hook. Sp. Fil.* ii. 39.

The figure is taken from Sir W. Hooker's plate of Dr. Wight's specimen from the Madras Peninsula. I have not been enough to find it unless I have confounded it with "*A. Æthiopicum*," Sir W. Hooker says it has quite the habit of *Æthiop* with sori resembling both as to position and form those of *A. Capillus-Veneris*.

Hab. Isle of Bourbon, Madras Peninsula, Malacca.

PLATE No. XVIII.

Adiantum emargin
(Will)

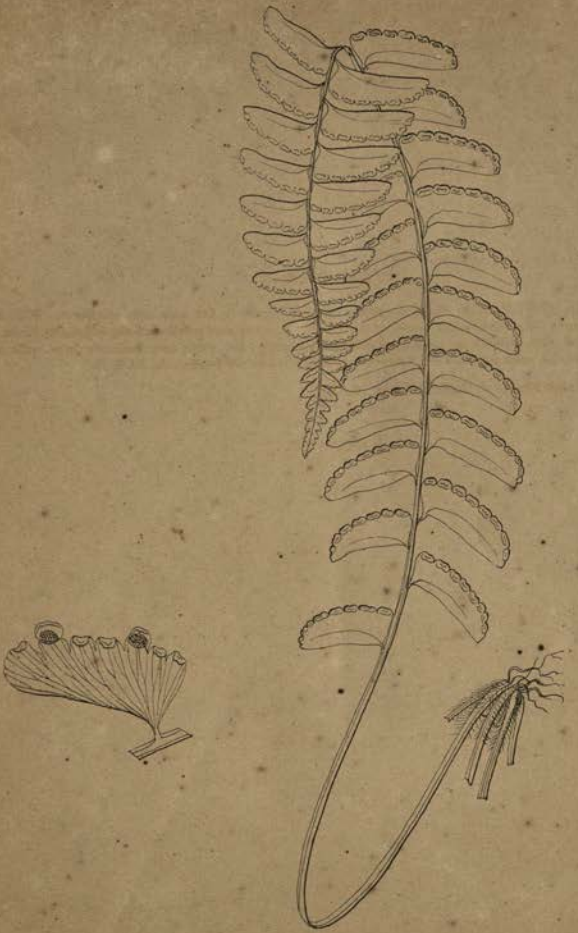
ADIANTEÆ.

ADIANTUM SOBOLIFERUM. (Wall.) Everywhere glabrous, fronds, (a foot high often soboliferous, *Wall.*) broadly lanceolate pinnated, pinnæ sub-membranaceous sessile, or lower ones only on very short petioles semi-elliptical slightly falcate, obtuse the upper base truncated and parallel with the rachis, upper margin rather equally lobed, sterile ones denticulate, lobes soriferous, sori sub-reniform, stipes ebeneous, rachis and stipes with a membranous margin on each side!—*Hook. Sp. Fil.* ii. 13.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Burmah.

PLATE No. XIX.



Adiantum soboliferum
(Wall)

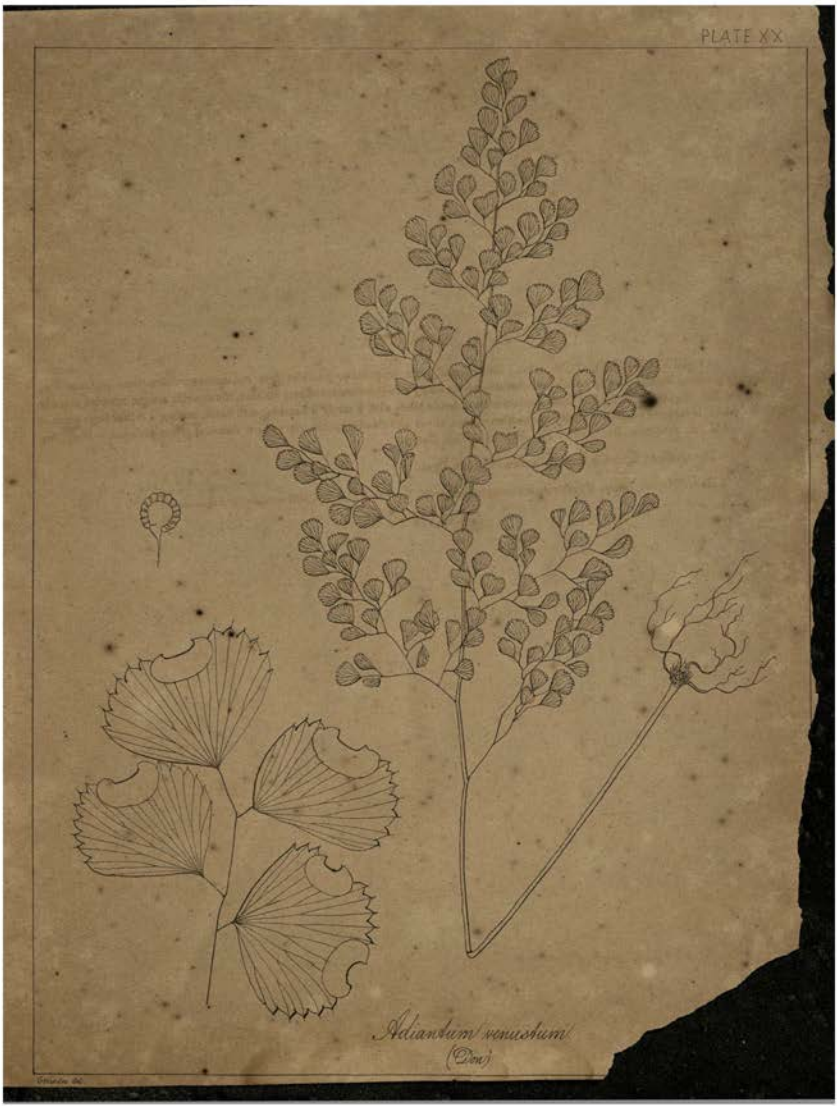
ADIANTEÆ.

ADIANTUM VENUSTUM. (Don.) Rather small ovate tri-pinnate, pinnules firm membranaceo-chartaceous glabrous and slightly glaucous beneath shortly petiolulate obovato-cuneate rarely sub-rhombeo-acuminate striated, the superior margin rounded scarcely ever or but slightly, 2 or 3 lobed finely dentato-serrate, fertile lobes with 2 rarely 3 notches, each notch bearing a rather large sorus at the bottom, involucres reniform-cordate sub-membranaceous, stipes and slender rachis everywhere ebeneous glossy glabrous.—*Hook. Sp. Fil.* ii. 40.—A. venustum, *Don. Prodr. Fil. Nep.* 16.—*Wall. Cat.* 81.

The specimen figured is from Dalhousie, (Captain Dyas.)

Hab. Nepaul, Simla, Mussoorie, Sreenuggur, Kamroop, Meerut, Khasya, (6,500 elevation,) Affghanistan.

PLATE No. XX.


Adiantum venustum
(Don)

PTERIDEÆ.

ONYCHIUM. (See Ferns of Southern India, p. 10.)

ONYCHIUM LUCIDUM (Sp.) Caudex creeping ? stipites six inches to a foot and more long, and as well as the rachises pale brown or straminecus, frond a foot and more long, ovate-acuminate membranaceo-coriaceous, glossy 3-4 times pinnatisected (primary and secondary divisions pinnated,) segments uniform or nearly so in the sterile and fertile ones, all narrow linear a little tapering below ultimate ones moderately long, all gradually acuminated (not mucronate even in the fertile ones), sori oblong short occupying nearly the whole of the back of the segments, involucres white or cream-colour membranaceous meeting at the back.—*Hook. Sp. Fil.* ii. 121.—*Spreng. Syst. Veget.* iv. p. 66.—*Hook. Gen. Fil. t.* xi.—Cheilanthes lucida, *Wall. Cat. n.* 69;—Cheilanthes contigua, *Wall. Cat. n.* 69;—Leptostegia lucida, *Don. Prodr. Fl. Nep. p.* 14;—Scolopendrium lucidum, *Hamilton's* MS. *(fide Don.)*

The specimen figured is from Nynee Tal, (Mr. Oldham.)

Hab. Kumaon, Nepaul, (700 to 7,500 feet elevation,) Mussoorie, Garwal, Simla, Khasya, Mishmee, Nynee Tal.

PLATE No. XXI.

Onychium lucidum
(Spr.)

PTERIDEÆ.

PTERIS. (See Ferns of Southern India, p. 11.)

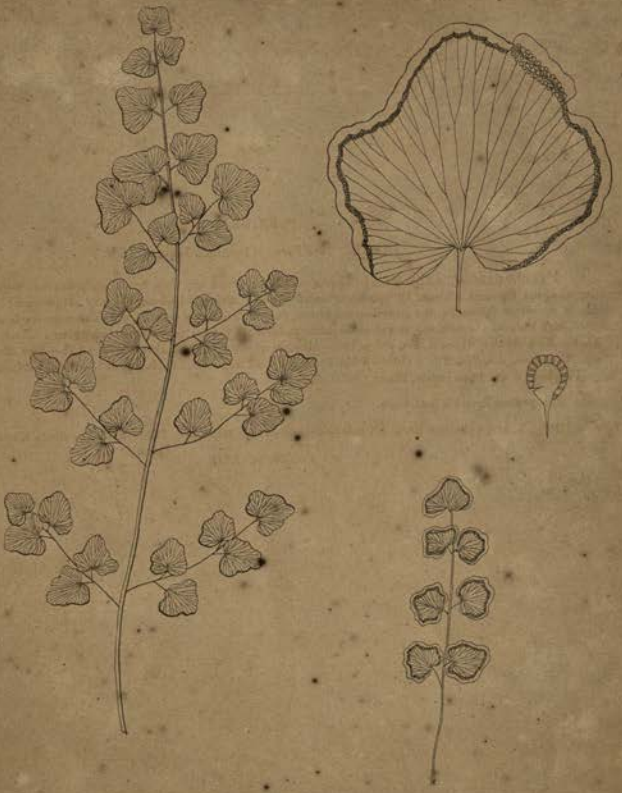
PTERIS CALOMELANOS (Link.) Glabrous, caudex short thick very scaly, fronds subspithameous cæspitose sub-coriaceous oblong-triangular bipinnate, pinnules all petiolulate cordato—(rarely subhastato)—triangular very obtuse entire sometimes sub-trilobate or sinuate at the margin, the sinus deep and narrow, veins dichotomously radiated, sori continuous, involucres membranaceous, stipites short scaly at the base and as well as the slender rachises and petioles black-ebeneous very glossy. *Hook. Sp. Fil.* ii. 140.—*Link. Fil. Hort. Berol. p.* 61.—*Fée. Gen. Fil. p.* 129;—Allosorus calomelanos, *Presl. Tent. Pterid. p.* 153.—*Hook. Bot. Mag. t.* 4,700;—Pteris calomelanos, *Sw. Syn. Fil. p.* 106.—*Willd. Sp. Plant.* v. p. 393.—*Kze. in Linn. p.* 525.—*Schlecht. Adumbr. Fil. Cap.* 43, *t.* 24;—Platyloma, *J. Sm.* Pteris hastata, *Thunb. (not of others.)*

The specimen figured is from Simla.

Hab. S. Africa, elevation 400 to 4,000 feet—Graham's Town, Macaliaberg, Isle of Bourbon,—Simla, Kumaon.

PLATE No. XXII.

PLATE XXII



Pteris calomelanos
(Link)

PTERIDEÆ.

PTERIS DACTYLINA (Hook.) 4 inches to a foot high, caudex creeping sending out wiry fibres, fronds sub-coriaceo-membranaceous rather rigid 2-6 inches long digitate, pinnæ 3-5 subradiate linear sessile slightly tapering below much and narrowly acuminated the sterile portions coarsely and deeply sinuuloso-serrate especially towards the apex, involucres rather broad subintramarginal membranaceous close-pressed, veins simple, stipites numerous tufted very slender and as well as the midribs of the pinnæ (very prominent beneath) stamineous. *Hook. Sp. Fil.* ii. 160.

Hab. Sikkim—Himalaya, (Dr. Thomson.)

PLATE No. XXIII.

Pteris dactylina
(Hook.)

PTERIDEÆ.

PTERIS GRIFFITHII (Hook.) A foot and more high and slender graceful, caudex none, roots of tufted fibres, frond ovato-lanceolate sub-membranaceous pinnate, upper pinnæ simple 2 or 3 of the lower pairs again pinnated simple, pinnæ and pinnules exactly linear ½ an inch to an inch and a half long obtuse, mostly opposite, every where entire sessile with the base adnate and decurrent so as to form a narrow wing to the rachis, lowest pinnules of the inferior pinnæ sometimes again divided, terminal pinnule always elongated, veins distant once forked, veinlets divaricating, sori continuous, involucres sub-intramarginal membranaceous not reaching to the apex, stipites slender longer than the fronds straminecous-brown and a little scaly at the base.—*Hook. Sp. Fil.* ii. 170.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Mishmee, Assam.

PLATE No. XXIV.

Pteris Griffithii
(Hook)

PTERIDEÆ.

CAMPTERIA. (See Ferns of Southern India, p. 14.)

CAMPTERIA WALLICHIANA (Ag.) Frond ample glabrous sub-membranaceous 3-partite, lateral branches compoundly divided terminal one elongated pinnated, pinnæ numerous sessile 4-6 inches long, linear-lanceolate acuminate deeply pinnatifid, segments linear-lanceolate obtuse, sterile ones serrulate all approximate about ½ an inch long, basal veins monarcuate, the rest free and forked rarely a solitary areole at the base of the costule, stipes very long, 5-6 feet stout rich castaneous and as well as the paler-coloured rachises very smooth and glossy.—*Hook. Sp. Fil.* ii. 206.—Pteris Wallichiana, *Ag. Sp. Gen. Pterid. p.* 69.—Pt. umbrosa, *Wall. Cat. n.* 109 *(not of Br.)*—Pt. pellucens, *Ag. Sp. Gen. Pterid. p.* 43 1—Pt. connexa, *J. Sm. Fil. Philip. in Hook. Bot. Journ.* iii. *p.* 405 *(name only)*—Pt. pectinata, *Don. Prodr. Fl. Ngoul, p.* 15.—(Agardh refers to this *Pt. aspericaulis*, Wall., which is however a slight var. of *Pt. quadriaurita.*)

The specimen figured is from Sikkim (Dr. Thomson.)

Hab. Kumaon, Gurhwal, Sikkim, Khasya, Luzon.

PLATE No. XXV.

Campteria Wallichiana
(Ag.)

PTERIDEÆ.

LITOBROCHIA. (See Ferns of Southern India, p. 73.)

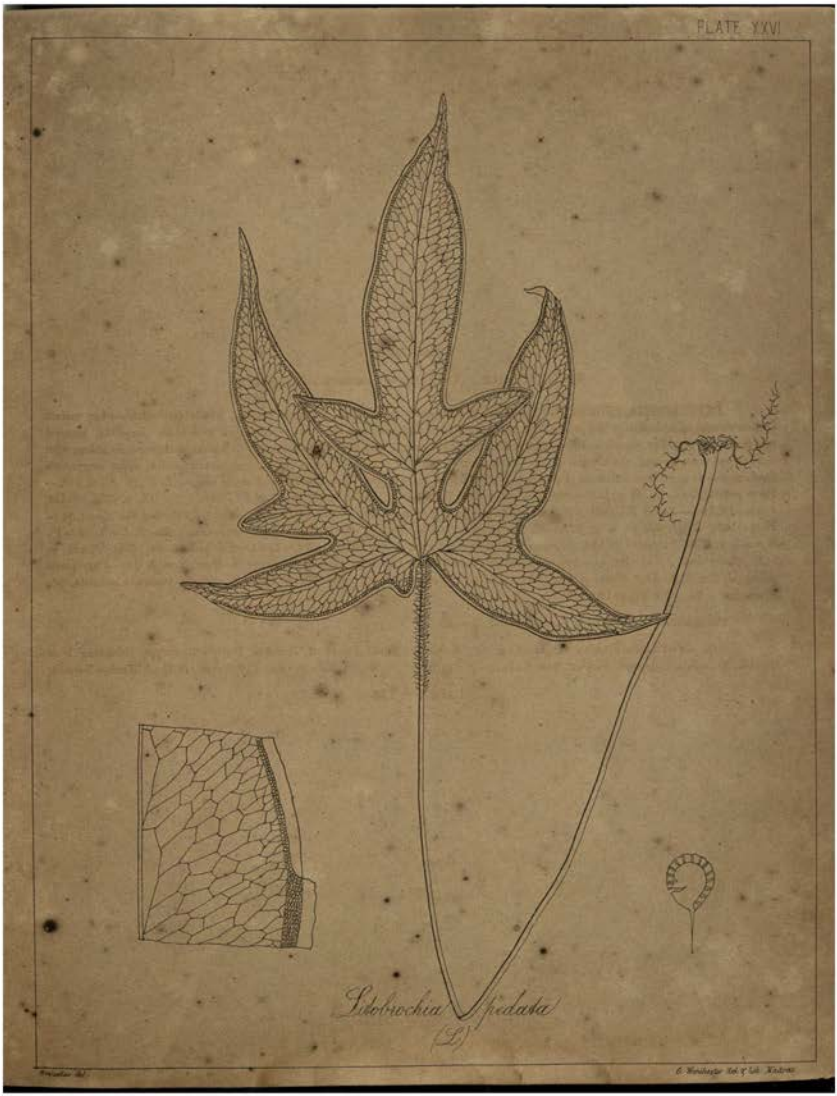
LITOBROCHIA PEDATA (L.) Caudex short thick erect or declined copiously rooting, fronds fasciculate, when mature coriaceous opaque cordate tripartito-pedate, lateral primary divisions bi-partite on the inferior side or on both sides pinnatifid, terminal one pinnatifid generally cuneate and narrowed at the base, the segments with entire lobes or again pinnatifid, ultimate ones oblong with more or less acute sinuses, the margin of the sterile plant crenulated, sori continuous, involucres narrow entire, veins everywhere anastomosing so as to form a network of oblong hexagonal areoles, stipes terete ebony-black hispid at the base.—*Hook. Sp. Fil.* ii. 208.—Pteris pedata, *Linn. Sp. Pl. p.* 1532.—*Sw. Syn. Fil. p.* 105.—*Langsd. et. Fisch. Ic. Fil. p.* 12. *et* 20.—*Willd. Sp. Pl. p.* 358.—*Schkh. Fil. p.* 91 *t.* 100.—*Raddi. Fil. t.* 65. *f.* 3. *&* 66 *and* 66 *b.*—*Br. Prodr. Nov. Holl. p.* 155.—*Hook. Bot. Mag. t.* 3,247, *and Fil. Exot. t.* 34.—Pt. palmata, *Willd. Sp. Pl.* v. *p.* 357.—Pt. collina, *Raddi. Fil. Bras. p.* 44. *t.* 65. *f.* 1, 2.—Pt. varians, *Raddi. t. c. t.* 64.—Pt. Mysurensis, *Wall. Cat. n.* 87/4.—Pt. polytoma, *Kze. in Linnæa*, xxiii. *p. p.* 289 *and* 322.—Litobrochia pedata, *Pr. Tent. Pterid. p.* 149.—*Moore Ind. Fil.* i. p. xliv.—Cassebeera pedata, *J. Sm. Gen. of Ferns p.* 47, *and Ex Ferns in Hort. Kew. p.* 14.—Doryopteris pedata, *J. Sm. Cat. Kew. Ferns, p.* 4 *and Cat. of Cult. Ferns, p.* 35.—*Fée. Gen. Fil. p.* 133.—Hemionitis, profunde laciniata, &c., *Plum. Am. p.* 24. *t.* 34. *Fil. p.* 130. *t.* 152.

The specimen figured is from Moulmein (Rev. Parish.)

Hab. West Indies, Jamaica, St. Domingo, Cuba, Martinique, Brazil, Island of Trinidad, Peru, Chacapoyas, Columbia, New Granada, Venezuela, Galapagos, Tropical New Holland—Pulney Hills (Dr. Wight), Nilgiris (Rev. E. Johnson,) *in Herb. Hook.*—Burmah.

PLATE No. XXVI.

PLATE XXVI



PTERIDEÆ.

LITOBROCHIA LUDENS (Wall.) Caudex long creeping branched, thicker than a crow's quill, scaly, throwing out copious woolly fibrous roots, fronds remote on the caudex long-stipitate coriaceous opaque pale beneath triangulari-subhastate and undivided, or hastately 5 lobed or deeply 3 lobed or 3 partite and pedate, the terminal lobe again 3 or pinnatifidly 5 lobed, the lateral lobes pinnatifid more or less deeply on the inferior side *(decursus pinnatifidis,)* segments acuminate broad-lanceolate or long-linear, veins everywhere laxly reticulated, the areoles oblong and mostly parallel or nearly so with the costa and margin, sori on the most deeply divided and narrowest fronds continuous, stipes very long and as well as the main rachises beneath black-ebeneous.—*Hook. Sp. Fil.* ii. 219.—Pteris ludens, *Wall. Cat.* n. 88.—Doryopteris Wallichii, *J. Sm. En. Phil. Philipp. in Hook. Bot. Journ.* iii. *p.* 404.

The specimen figured is from Moulmein (Rev. Parish.)

Hab. Burmah, Luzon.

PLATE No. XXVII.

PLATE XXVII.

Litrobrochia lucens (Wall.)

LINDSÆEÆ.

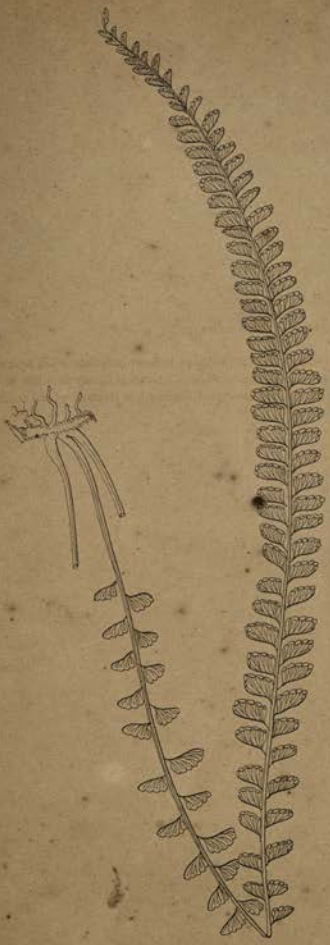
LINDSÆA. (See Ferns of Southern India, p. 7.)

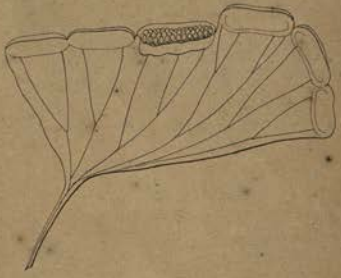
LINDSÆA LOBBIANA (Hook.) Caudex somewhat creeping, fronds tufted pinnate linear-lanceolate much acuminate, lower pinnæ remote, the rest approximate, all of them slightly petiolate patent sub-membranaceous subnitent obliquely flabellate or half ovate the superior base truncate, upper margin carved (convex) lobate soriferous, sori interrupted linear, stipes rather short and rachis brown.—*Hook. Sp. Fil.* i. 205.

The specimen figured is from Moulmein (Rev. Parish.)

Hab. Burmah, Java.

PLATE No. XXVIII.





Lindsaea Lobbiana
(Hook.)

LINDSÆEÆ.

SCHIZOLOMA. (See Ferns of Southern India, p. 9.)

SCHIZOLOMA GRIFFITHIANUM (Hook.) Lax and flaccid, caudex creeping short, stipites shorter than the elongato-anceolate simple membranaceous costate frond, veins reticulated, sorus continuous round the entire margin.—*Hook. Sp. Fil.* i. 219.

Hab. Mergui, Burmah.

PLATE No. XXIX.

PLATE XXIX.

Schizoloma Griffithianum
(Hook)

TRIBE. GLEICHENINEÆ.

GLEICHENIA. (See Ferns of Southern India, p. 25.)

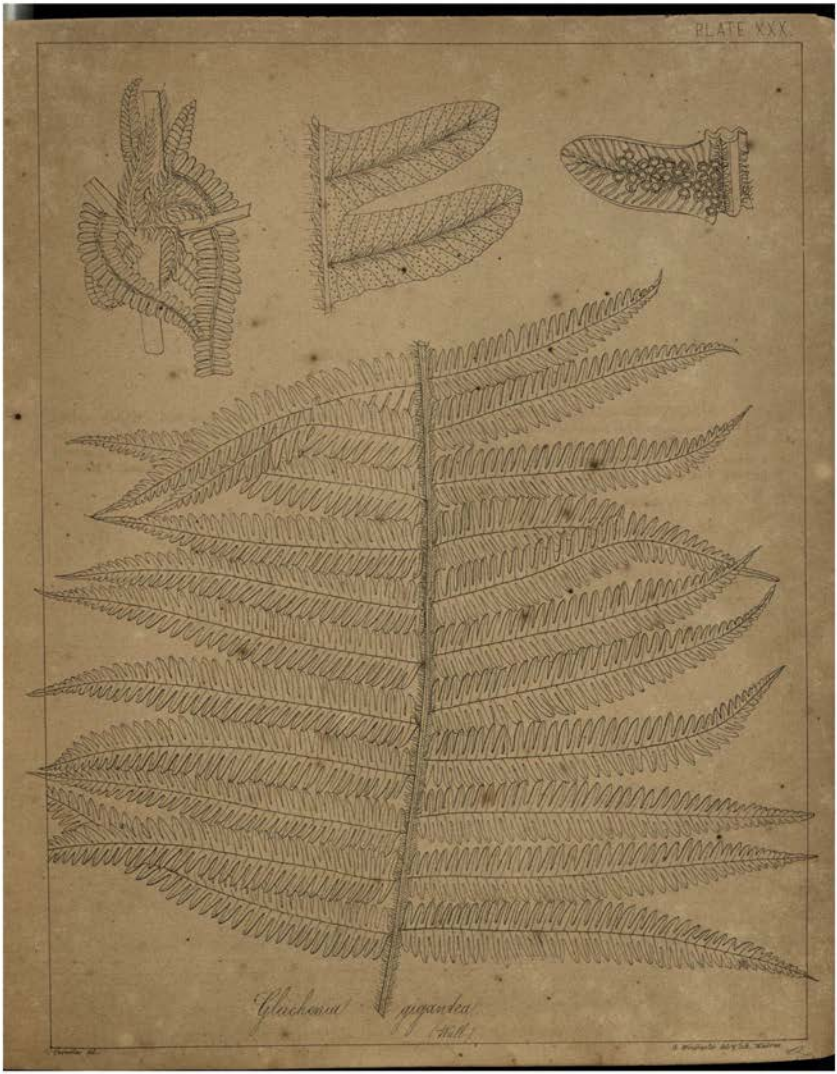
GLEICHENIA GIGANTEA (Wall.) primary pinnæ opposite oblong acuminate, its rachis above with a slightly elevated very obtuse margin, secondary lanceolate acuminate alternate deeply pinnatifid, segments oval, oblong, very obtuse entire with an elevated crest at the base above forming an interrupted marginal line to the rachis which beneath as well as the costa is woolly, scarcely glaucous, capsules 3-5.—*Hook. Sp. Fil.* 1.5 *Wall. Cat. n.* 157.—Hicriopteris speciosa, *Presl.*; Mesosorus giganteus, *Hasskl.*; Mertensai gigantea, *Wall. Hb.*

The specimen figured is from Sikkim (Thomson.)

Hab. Assam, Nepaul Bhotan, Sikkim, Khasya, China, Fokien, Java.

PLATE No. XXX.

PLATE XXX.



Gleichenia gigantea
(Hill.)

ASPIDIEÆ.

POLYSTICHUM. (See "Ferns of Southern India," p. 41.)

POLYSTICHUM STIMULANS (Kunze.) Caudex short stout oblique very scaly, stipites densely tufted 2-4 inches long often chaffy flexuose slender and tawny as is the rachis, fronds sub-coriaceous 4-6-8 inches long, linear or oblong-lanceolate acute pinnate, pinnæ lax distant distinctly petiolate from an oblique truncate cuneate base rhomboideo-triangular with generally a spinose auricle at each base and with two or three large sharp serratures which as well as the apex are terminated with a spine, rarely one of the auricles becomes a free pinnule, sori few in two rows one on each side of the costules.—*Hook. Sp. Fil.* iv. 12.—*Kze. Herb. fide. Metten. Aspid p.* 43.—Polystichum, *Pr. Tent. Pterid. p.* 83.—Aspid pungens, *Wall. Cat. n.* 368, *(not Klfs.)*—Aspid ilicifolium, *Don. Prodr. Nep. p.* 3 *(not Fée.)*—Aspid sagittatum, *Jacquem. Mss. in Herb. Mus. Paris and Herb. Hook.*

The specimen figured is from Sikkim, (Dr. Thomson) and partly from Sir Will. Hooker's plate in "*Species Filicum.*"

Hab. Nepaul, Kumaon (elevation 9,000 feet), Simla, Valley of the Jumna, Sikkim, Changtam, Tambur river.

PLATE No. XXXI.

Polystichum stimulans
(Kze)

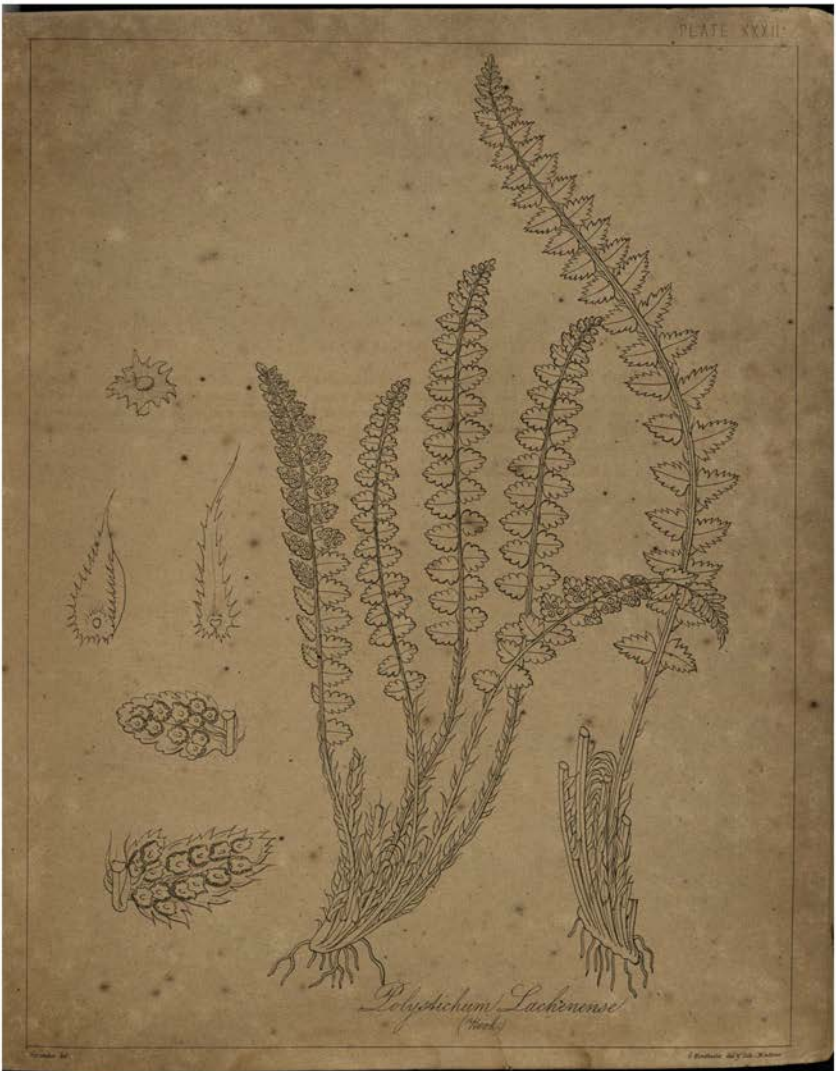
ASPIDIEÆ.

POLYSTICHUM LACHENENSE (Hook.) Caudex short oblique stout scaly above, stipites very densely tufted numerous and compact stout marcescent 2-4 inches long, sub-flexuose glossy black or dark brown scaly, fronds 4-8 inches long, linear-lanceolate coriaceous pinnate ; pinnæ, the largest less than ½ an inch long, patent rather distant sessile deltoideo-ovate sub-pinnatifido-crenate rather obtuse sub-pinnuloso-serrate or unarmed, sori in two rows on each pinnule, rachis straminéous setacco-palesceous with whitish appressed scales.—*Hook. Sp. Fil.* iv. 8.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Sikkim, Himalaya, Lachen.

PLATE No. XXXII.


Polystichum Lachenense
(Hook.)

ASPIDIEÆ.

POLYSTICHUM CÆPITOSUM (Wall.) Caudex a short thick scaly rhizome, scales often ciliated, stipites tufted slender 2-6 inches long, straminеous as well as the rachis, fronds 4 inches to a span and more long oblong—or linear-lanceolate acute rather than acuminate chartaceo-membranaceous often glossy pinnated, pinnæ rather distant horizontal ½-1¼ inch long petiolate from an entire obliquely cuneate truncate and obtusely auricled superior base, trapezoideo-ovate obtuse or acute sharply but scarcely mucronato-serrate, inferior base incised, sori uniseriate on the pinnæ and the auricles between the costa and the margin, involucres peltate ciliate at length deciduous.—*Hook. Sp. Fil.* iv. 13.—*Wall. Cat. n.* 367.—*Metten. Aspid. p.* 367.—Polystichum, *Schott. Pr.*—Aspidium obliquum, *Don, Nepaul p.* 43 *(fide Moore.)*

The specimen figured is from Nynee Tal, (Oldham.)

Hab. Northern India especially in the Himalayas (elevation 4—10,000 feet,) Nepaul, Simla, Kumaon, Nynee Tal, Lachen, Sikkim, Bhotan.

PLATE No. XXXIII.

Polystichum caespitosum
(Kaulf.)

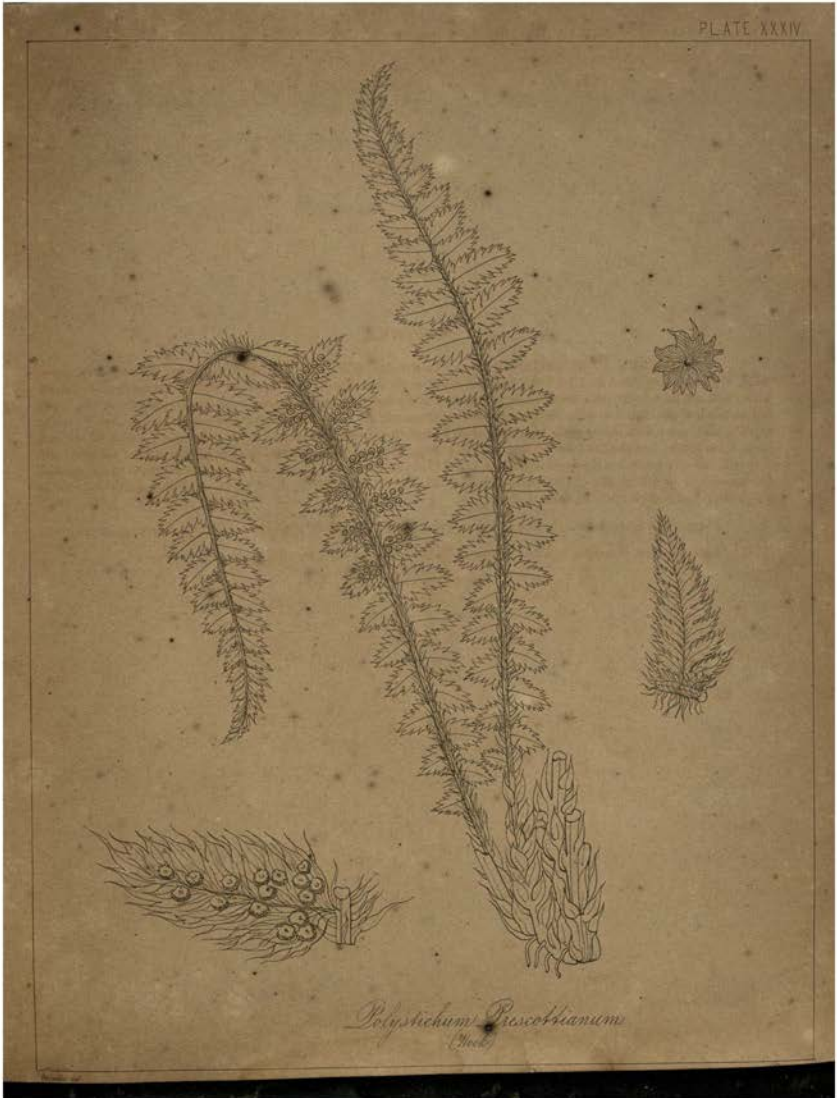
ASPIDIEÆ.

POLYSTICHUM PRESCOTTIANUM (Hook.) Caudex short thick erect or declined paleaceous with very large brown scales, stipites densely tufted stout 1-4 inches long, and as well as the stramineous glossy rachis and costæ and veins especially beneath villous with soft lax hair-like pale-coloured scales, on the stipes mixed with large ovate membranaceous ones, fronds 1-2 feet long, rarely in the broadest part 2 inches wide, elongato-lanceolate acuminate soft and membranaceous gradually narrowing at the base pinnate or sub-bi-pinnate, pinnæ ovato-oblong sessile tapering to an obtuse apex deeply pinnatifid (except at the very apex,) almost to the costa (some of the inferior ones pinnate), lobes or pinnules ovate or oblong without auricle strongly and uniformly serrated the serratures with long soft hair-like points, sori chiefly on the superior half of the frond in two rows near the costule, involucres peltate entire membranaceous.—*Hook. Sp. Fil.* iv. 22.—Aspid. Prescottianum, *Wall. Cat. n.* 363.—*Metten. Aspid. p.* 48.—Polypodium Pseudo-Lonchitis, *Jacquemont, Mss. in Herb. Hook. β*; frond bi-pinnate.

The specimen figured is from the Himalayas, (Dr. Thomson) and from Sir W. Hooker's plate in "Species Filicum."

Hab. Kumaon, Himalayas from extreme west to Bhotan in the east (elevation 10—12,000 feet.)

PLATE No. XXXIV.



Polystichum Prescottianum
(Wall.)

ASPIDIEÆ.

POLYSTICHUM SEMICORDATUM (Sw.) Caudex thick horizontal creeping? very densely clothed with long (¾ of an inch) subulate scales, stipites solitary (not tufted) stout a span and more long, shaggy with long slender paleaceous scales at length deciduous, fronds 2-3 feet long, broad or ovato-lanceolate (8-10 inches wide), coriaceo-membranaceous blackish-green (when dry) pinnated, pinnæ articulated upon the rachis numerous approximate horizontal, from a broad sessile shortly petiolated semi-cordate base oblong acuminate straight or falcate entire or obtusely crenate (near spinuulose,) sori mostly on the back of the veinlets in four series two on each side, the inner one close by the costa the other between it and the margin, veins fascicled, involucres slightly convex depressed in the middle suberose—var. *δ. truncatum* ; pinnæ at the base on each side transversely truncated.

The specimen figured is from Moulmein, (Rev. C. S. P. Parish.)

Hab. Twa Kabin Moulmein—This species occurs in slightly altered varieties in America, the W. Indian islands, Luzon, Cochin, China, and Borneo.

PLATE No. XXXV.

Polystichum semicordatum
(Sw.)

ASPIDIEÆ.

LASTREA. (See "Ferns of Southern India," p. 33.)

LASTREA FÆNICULACEA (Hook.) Caudex stout creeping densely clothed with tawny satiny ovate-acuminate paleaceous scales, stipites a span to a foot long, stout below and there paleaceous like the caudex, fronds pergamentaceous glossy translucent when fresh, 1-2 feet and more long, oblong-ovate acuminate supradecompoundly pinnate, primary pinnæ (inferior ones) from 4 inches to almost a foot long, long-petioled ovate finely acuminate, secondary ones 1-3 inches long also petioled, these are broken up into a succession of smaller and lesser pinnæ or pinnules and all finely cut into linear acute obscurely costate segments simple or once or twice forked or having a lateral, short tooth which generally bears the solitary rather small sorus, sori sub-globose as broad as the segment or tooth; involucres small dark-brown convex reniform of sub-coriaceous texture, rachises with a few scattered flexuose setæ.—*Hook. Sp. Fil.* iv. 36.—Z. aristata γ. dissecta *Moore.*

The specimen figured is from Sikkim, (Dr. Thomson.)

Hab. Chola, Sikkim, (elevation 8—10,000 feet.)

PLATE No. XXXVI.

PLATE XXXVI

Lastrea foeniculacea
(Kuhl)

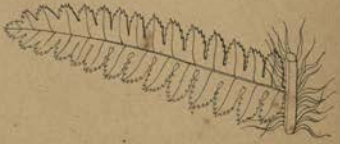
ASPIDIEÆ.

LASTREA BRUNONIANA (Hook.) Caudex short thick erect clothed as are all the nascent fronds with a dense mass of large subulato-lanceolate brown scales ½-¾ of an inch long, stipites tufted 4 inches to a span long, swollen at the base and as well as the (usually) black rachis squamose with long dark-brown glossy lanceolato-subulate patent flexuose scales mixed with others quite setiform, fronds subcoriaceo-membranaceous a span to 12-14 inches long, 2 inches broad, moderately attenuated at the base, very obtuse at the apex oblong-lanceolate pinnate, pinnæ approximate, sessile horizontally patent oblong very obtuse deeply sometimes quite to the rachis pinnatifid segments ¼ inch long, horizontal broad oblong or oval obtuse, lobato-pinnatifid the margins strongly and very sharply serrated, the teeth spreading sub-setaceous at the points, principal veins (or costules) flexuose, veinlets forked distant, sori 3-4 on each side the costule between it and the margin, involucres reniform.—*Hook. Sp. Fil.* iv. 113.—Aspidium, *Wall. Cat.* n. 344.—*Metten. Aspid. p.* 54.

The figure is taken from Sir W. Hooker's "Species Filicum.")

Hab. Kumaon, (elevation 12,000 feet,) Sikkim—Himalaya, 13,000—15,000 feet—Punjab.

PLATE No. XXXVII.



Lastrea Brononiana.
(Hook.)

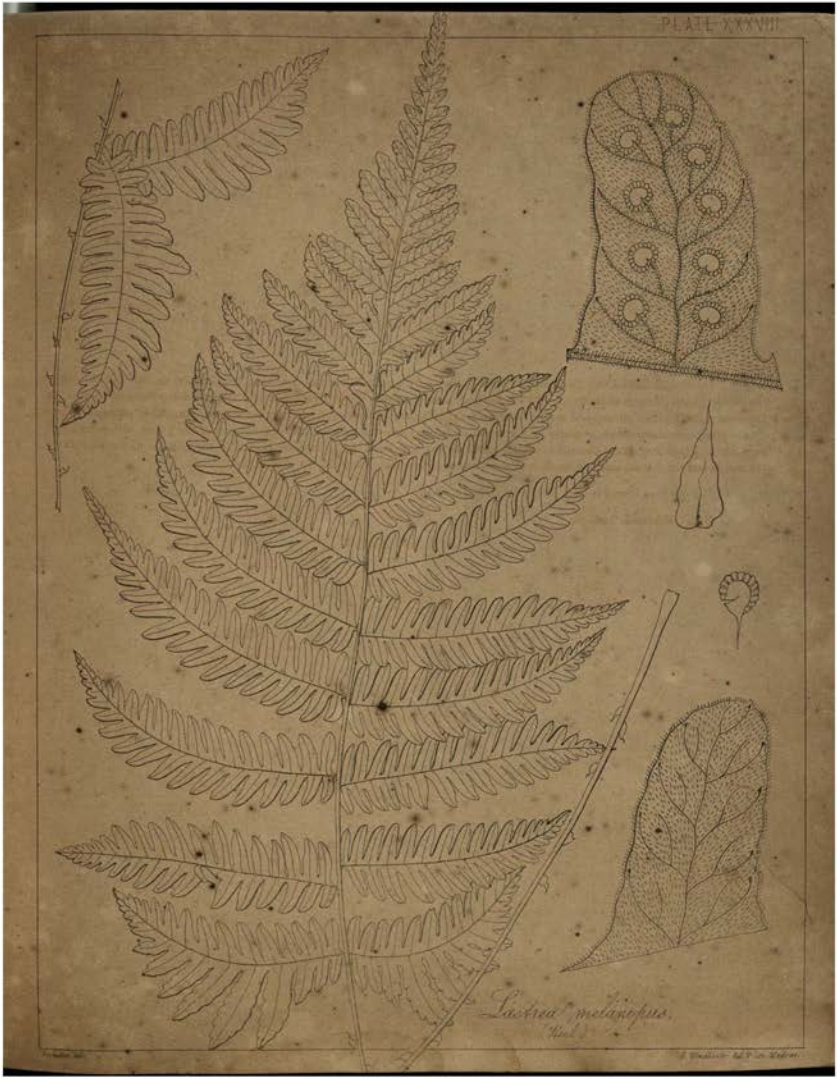
ASPIDIEÆ.

LASTREA MELANOPUS (Hook.) Caudex ? stipes a little scaly below a span or more long, rather slender and as well as the rachis glossy ebeneous-black, fronds 12-14 inches long, membranaceous bright-green obsoletely subglandular-pubescent especially on the costæ pinnate, pinnæ sub-opposite sessile 4-6 inches long, 1-1½ inch wide, oblong shortly acuminated pinnatifid, segments oblong obtuse rarely subfalcate entire or nearly so, lowest pair of pinnæ semiovate subfalcate the inferior half of the pinnæ with much longer segments 1-1½ inch long, lobato-pinnatifid, veinlets forked distant, sori small on the superior branch of the veins equi-distant, between the margin and the costule, involucre small membranaceous reniform ciliated.—*Hook. Sp. Fil.* iv. 110.

The specimen figured is from Moulmein, (Rev. Parish.)

Hab. Moulmein, Amboyna ?

PLATE No. XXXVIII.


Lastrea melanopus.
Wall.

ASPIDIEÆ.

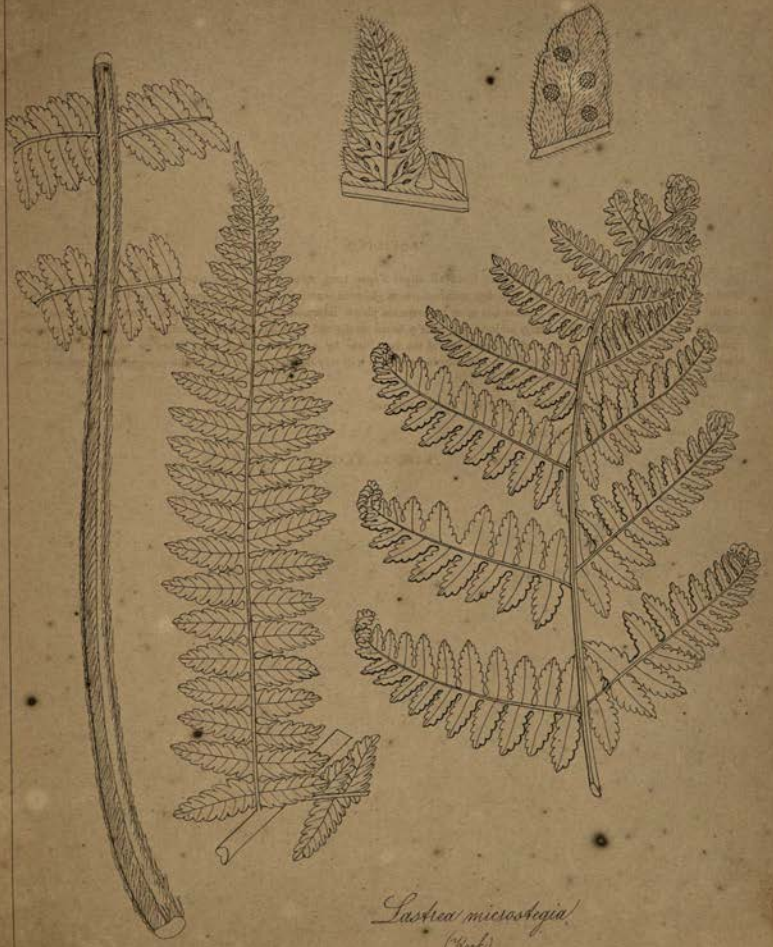
LASTREA MICROSTEGIA (Hook.) Caudex ? stipes a span long, stout tawny-brown laxly scaly, rachis and costæ stout straminеous, frond 2-2½ feet long, broad lanceolate membranaceous glabrous acuminate bi-pinnate, pinnæ sessile 4-5 of the lowest pairs shorter 4 inches long sterile and with broader and more approximate pinnæ intermediate ones 6-8 inches long, from a broad base oblong gradually acuminated, pinnules ¾ to nearly an inch long, from a broad sessile and quite adnate base pyramidally and obtusely acuminated pinnatifid about half way down to the costæ all connected at the very base by a narrow costal wing, lobes or segments small ovate blunt entire, veinlets distant, sori minute 4-6 on each lobe in two series half way between the costule at the margin, involucre very small reniform pale greenish-brown.—*Hook. Sp. Fil.* iv. 119.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Khasya, (temperate region.)

PLATE No. XXXIX.

PLATE XXXIX.



Lastrea microstegia.
(Hook)

ASPIDIEÆ.

LASTREA APICIFLORA (Hook.) Caudex short stout erect clothed above with subulate scales, stipites stout a span to a foot and more long, scaly with appressed lanceolate scales at the base the rest and the stout very straight rachis clothed with numerous close pressed scales varying in shape from small ovate to long lanceolate, fronds 2-3-4 feet long, oblong or sub-oval lanceolate acuminate coriaceo-membranaceous pinnate, pinnæ numerous alternate horizontal subfalcate 5-6 inches long, often an inch broad from a broad sessile base oblong acuminate deeply even to the rachis pinnatifid (almost again pinnate), segments approximate parallelogram-oblong straight obtuse or retuse angulato-dentate at the apex, veinlets numerous simple or forked, sori 5-6 only at the apex of the frond, involucres firm-membranaceous reniform, costæ very paleaceous with appressed subulate scales beneath.—*Hook. Sp. Fil.* iv. 112.—Aspidium, *Wall. Cat. n.* 345.—*Metten. Aspid. p.* 54.

The specimen figured is from Sikkim, Himalaya, (Dr. Thomson.)

Hab. Nepaul, Sikkim, Himalaya, (elevation 9,000.)

PLATE No. XL.

PLATE XL.

Lastrea apiciflora
(Wall.)

ASPIDIEÆ.

LASTREA FALCONERI (Hook.) Caudex? stipes a foot long very coarse and stout quite squarrose for nearly its whole length with large broad silky ferruginous soft scales mixed with smaller subulate ones, these latter only still smaller also clothe the main and secondary rachises, fronds 1½ foot long, oblong scarcely acuminate firm rigid coriaceous slightly villous bi-pinnate, pinnæ 4-6 inches long an inch wide, erecto-patent oblong-lanceolate, pinnules sessile linear-oblong ½-¾ of an inch long, about half way down pinnatifid with short round entire lobes, the margins reflexed, sori rather large copious one to each lobe, involucre brown very membranaceous cordato-reniform very convex so as to be almost hemispherical.—*Hook. Sp. Fil.* iv. 123.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Kashmir.

PLATE No. XLI.

Lastrea Falconeri
(Hook.)

ASPIDIEÆ.

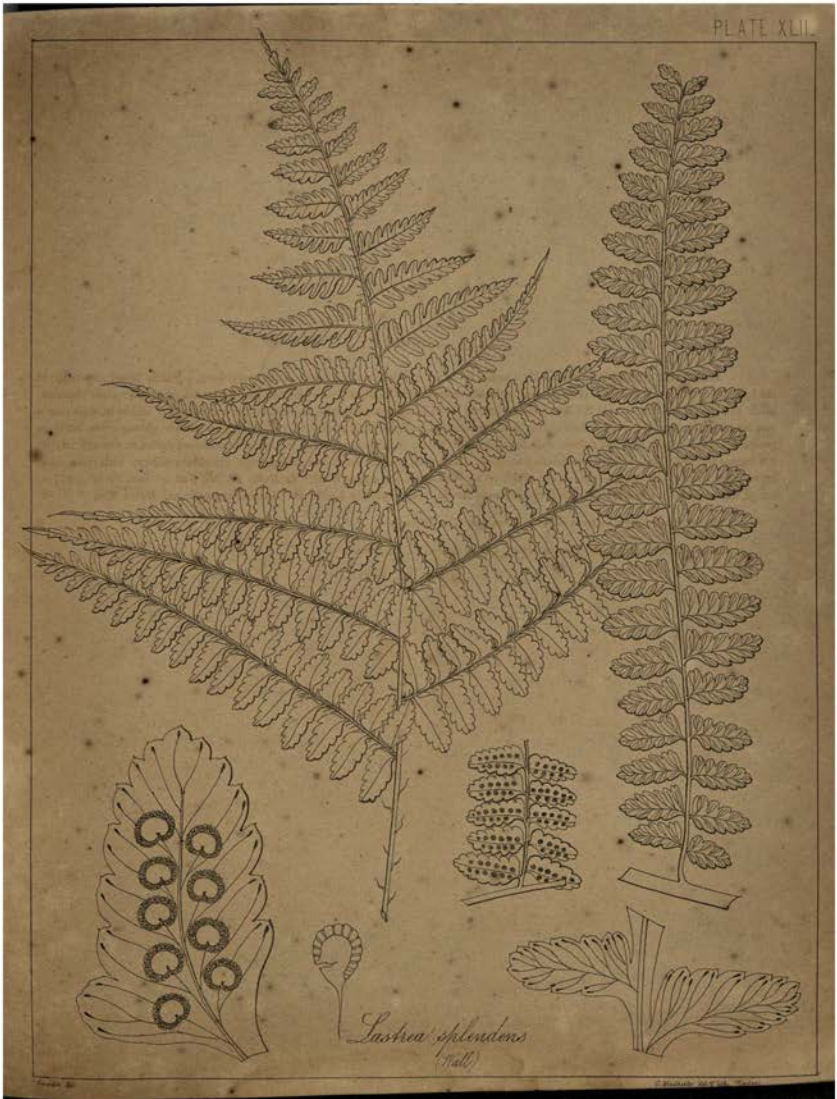
LASTREA SPLENDENS (Hook.) Caudex 1—stipes 1-2 feet (and probably much more) long, ½-¾ inch broad especially at the base, more or less clothed with close-pressed deciduous scales dark chestnut-brown or often (as well as the principal rachis) ebeneous-black and polished, frond ample 2-4 feet long, coriaceous broad-lanceolate acuminate bi-pinnate, primary pinnæ 6 inches to more than a foot long 1½-2 inches wide, subpetiolate oblong finely acuminated and pinnatifid at the very apex, pinnæ sessile oblong-ovate acute or generally broader at the base and subauricled above, the rest crenate or lobato-pinnatifid, the lobes short obtuse entire or dentate, veinlets 2-3 furcate sori 8-14 large conspicuous forming two lines close to the costule, involucres rather large orbicular-reniform coriaceous dark-brown often paler at the margin.—*Hook. Sp. Fil.* iv. 126.—"Lastrea splendens, *Wall.*" *in Hook. Fl. Ms. Cat. of Ind. Ferns n.* 267.—var. *β, angustifrons*; smaller, stipes black or testaceous-brown, frond copiously 3-pinnate. Lastrea angustifrons, *Moore Mss.*

The specimen figured is from Sikkim, Himalaya, (Dr. Thomson.)

Hab. Sikkim, Himalaya, Bhotan Malay, Peninsula,—*Var. β*, Nepaul.

PLATE No. XLII.

PLATE XLII.



ASPIDIEÆ.

LASTREA PARISHII (Hook.) Caudex creeping, stipes solitary lax soft slender glabrous and quite scaleless a little downy at the summit, fronds 4-6 inches long and as much broad pale-green pellucid succulent membranaceous when dry, pubescently hairy on the costæ, pentangular-deltoid acuminate ternately tripinnate pinnatifid at the apex, primary pinnæ oblong acuminate sub-opposite deeply nearly to the rachis pinnatifid, inferior ones pinnate at the base and petioled, segments and pinnules $\frac{1}{4}$-$\frac{3}{4}$ of an inch long, strongly serrated or acutely pinnatifid and all decurrent so as to form a winged rachis-basal pair a primary pinnæ twice or thrice as large as the rest and remote from them half-ovate acuminate, the lowest basal pinnæ much longer than the rest and more compound, veinlets lax distant twice or thrice forked, sori equidistant between the costule and the margin, involucre small rotundato-reniform one of the lobes sometimes a little elongated, rachis fusco-pubescent.—*Hook. Sp. Fil.* iv. 131.

The specimen figured is from Moulmein, (Rev. Parish.)

Hab. Moulmein (shady moist places limestone rocks.)

PLATE No. XLIII.

Lastrea Parishii
(Hook.)

ASPIDIEÆ.

LASTREA THELYPTERIS (Presl.) Caudex very long, slender branched creeping black copiously rooting, stipites distant about a foot long, slender stramineous black at the base, fronds firm-membranaceous 1 2 feet long, oblong acuminated glabrous, or pubescent on the costæ beneath, pinnated, pinnæ sub-opposite patent 2-4 inches long, sessile linear-oblong acuminated pinnatifid almost to the apex and down nearly to the rachis, segments ovate or oblong acute rarely sub-falcate quite entire, veinlets simple the lower once or twice forked, sori copious nearer the recurved margin than the costule, involucres cordato- reniform with glandular hairs at the margin deciduous.—*Hook. Sp. Fil.* iv. 88.—*Hook. Brit. Ferns t.* 13.—Aspidium, *Sw. Syn. Fil. p.* 57.—*Willd. Sp. Pl.* v. *p.* 249.—*Schk. Fil. p.* 51 *t.* 52.—*Sm. Engl. Bot. t.* 400.—*Metten. Aspid. p.* 112.— *Hook. and Arn. Brit. Fil. ed.* viii. *p.* 583.—*Asa Gray, Man of Bot. p.* 526.

The specimen figured is from the Khasya Hills.

Hab. Khasya Hills, Kashmir, Manchuria, Amur.—Marshy ground throughout Europe and North America.

PLATE No. XLIV.

Lastrea Thelypteris
(Resl.)

ASPIDIEÆ.

CYRTOMIUM. (See "Ferns of Southern India," p. 41.)

CYRTOMIUM CADUCUM (Wall.) Caudex sub-erect, stout, stipites a foot and more long, straminеous very paleaceous with black large lanceolate scales below with a brown edge above these are broader membranaceous lax brown ones, fronds coriaceous 1-1½ foot long, broad-lanceolate acuminate pinnated (or sub-bi-pinnate,) pinnæ numerous 3-5 inches long, ½ an inch to an inch wide, falcato-lanceolate acuminated unequally so at the base, superior base truncated and dilated with a more or less distinct obtuse or acute auricle acutely subaristato-serrated not unfrequently lobato-pinnatifid and in some inferior pinnæ quite pinnated with obovate rather obtuse pinnules, veins copious approximate erecto-patent pinnate free or with the veinlets more or less combined forming elongated areoles generally including a long free veinlet and sometimes the whole frond is bi-pinnate and the veinlets are then always free, and the plant has no very distant resemblance to some forms of *Polystichum aculeatum*, sori large scattered, involucres very conspicuous orbicular peltate but sometimes with a small sinus.—*Hook. Sp. Fil.* iv 39.—*Wall. Cat. n.* 381.—*Hook. et. Grev. Ic. Fil. t.* 171.—*Metten. Aspid. p.* 35.—Cyrtomium, *Pr. Tent. Pterid. p.* 77.—*Moore Ind. Fil. p.* 276, *(excluding the S. American stations).*—Lastrea Hookeriana, *Pr. Tent. Pterid. p.* 77.

The specimen figured is from the Khasya Hills, (Dr. Thomson.)

Hab. Nepaul, Sikkim, Khasya, Assam, Bhootan.

PLATE No. XLV.

Cystopteris caducum
(Wall.)

ASPIDIEÆ.

NEPHRODIUM. (See "Ferns of Southern India," p. 29.)

NEPHRODIUM HIRSUTUM (J. Sm.) Stipes and principal portion of the rachis villous with long soft close-pressed hairs, fronds 3-4 feet long, ovato-lanceolate acuminate membranaceous, 1½ foot and more wide pinnated slightly hairy on the costa above glabrous and minutely glanduloso-resiniferous beneath, pinnæ very numerous approximate sessile 10 inches long, in the broadest part of the frond and nearly an inch wide, linear oblong finely acuminate truncated at the base uniformly pinnatifid about half way down to the costa, at the base beneath on the rachis is a large conspicuous disciform scale or gland chiefly present on the lower half of the frond, segments ovato-oblong sub-falcate entire rather obtuse, one or two of the lowest pairs of veinlets combined, sori most copious on the upper half of the frond near the middle of all the veinlets, involucres glabrous.—*Hook. Sp. Fil.* iv. 170.—*J. Sm. in Hook. Journ. Bot.* iii. *p.* 412, *(name only.)*—*Pr. Epimel Bot. p.* 48.—Aspid, *Metten. Aspid. p.* 107.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Assam, Luzon.

PLATE No. XLVI.

Nephrodium hirsutum
(J. Sm.)

ASPIDIEÆ.

SAGENIA. (See "Ferns of Southern India," p. 27.)

SAGENIA HETEROCARPA (Bedd.) Fronds coriaceo-membranaceous pinnate, pinnæ opposite or sub-opposite lanceolate entire very finely acuminate, very shortly petiolate, 6 inches long by 1½ inch wide, petioles furnished with a small scaly bud on the upper side at the base of the pinnæ, costa prominent, primary pinnate veins conspicuous falcate with their areoles divided into 9-12 areoles by the transverse flexuose secondary veins within which are included numerous free simple or forked veinlets, sori copious minute, indusium very various in shape generally hippocrepiform or reniform but sometimes athyrioid or asplenioid.

The specimen figured is from the Khasya Hills, (Dr. Thomson.)

My specimens are marked by Mr. Moore "*new species near S. Menyanthidis.*"

PLATE No. XLVII.

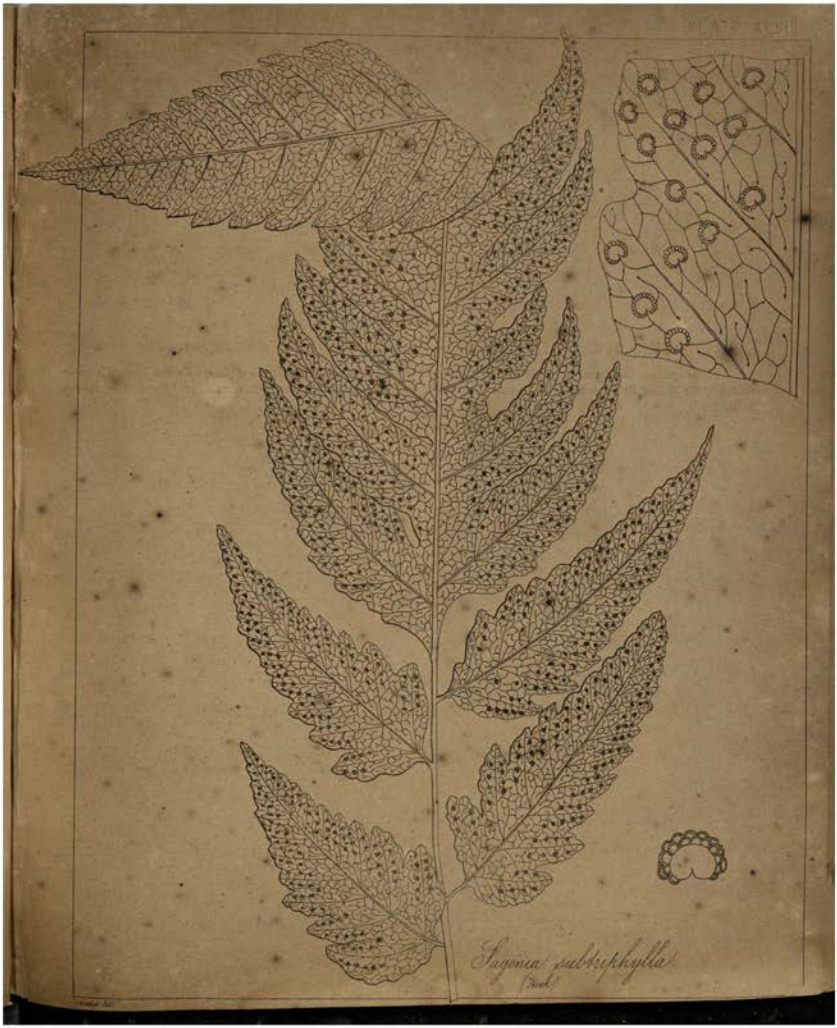
Sagenia heterocarpa (Bedd.)

ASPIDIEÆ.

SAGENIA SUBTRIPHYLLA (Hook.) (See "Ferns of Southern India," p. 81, and Plate ccxlii.)

The specimen here figured is from Moulmein, (Parish) ; it is 3 feet high and the lowest pair of pinnæ are a foot long ; it is considered by Sir William Hooker to belong to the same species as the small form found in Ceylon (Plate ccxlii. of "Ferns of Southern India.")

PLATE No. XLVIII.


Sagenia subtriphylla
(Hook.)

LOMARIEÆ.

BLECHNUM. (See "Ferns of Southern India," p. 10.)

BLECHNUM NITIDUM (Pr.) Caudex ——— 1 fronds ample 1½-3 feet oblong-ovate in circumscription truncate at the base firm-coriaceous pinnatifid almost to the rachis, segments very numerous approximate linear-lanceolate acuminate more or less falcate sharply serrated, lower ones almost equal in length to those above them and free (so that the fronds are pinnated below,) veins very close simple patent, sori close to the costa continuous from the base to near the apex, stipes elongated nearly free from scales, rachis 2-furrowed beneath.—*Hook. Sp. Fil.* iii. 44.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Mishmee, Assam, Luzon, Isle of Sorzogon, South Brazil, Guam, Marianne Islands.

PLATE No. XLIX.

Blechnum nitidum

LOMARIEÆ.

BLECHNIDUM. (Moore Index Filicum, p. clv.) (Blechni Sp. *Hooker.*)

Gen. char. *Sori* indusiate linear continuous on a transverse receptacle approximate to the costa. *Indusium* linear opening along the inward side. *Veins* springing from a central costa immersed, *venules* reticulated forming a series of large angular areoles next the costa, other narrower ones often extended nearly to the margin; ultimate *veinlets* free and thickened at the apex.

Fronds pinnatifid sub-coriaceous. This genus only differs from Blechnum in its reticulated venation. (Moore.)

BLECHNIDIUM MELANOPUS (Hook.) Caudex ——— ? frond spithameous (and more?) broadly falcato-lanceolate glossy sub-coriaceous pinnate, pinnæ very approximate from a rather broad adnate base linear-oblong falcate somewhat acute the margin entire narrowly revolute uppermost ones gradually confluent into a lanceolate elongated lobe the lowest 3-4 pair suddenly diminished short very obtuse sub-auriculate at the superior base, veins internal reticulated forming large angled areoles next the costa, narrower oblique ones often extending to the margin, ultimate veinlets free and clavate at their apex just within the margin, sori quite close to the costa, continuous not reaching to the apex of the pinnæ, stipes (about a span long,) and lower half of the rachis beneath black.—*Hook. Sp. Fil. iv.* 64.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Khasya Hills.

PLATE No. L.

Blechnidium melanopus
(Hooker)

PLATYLOMEÆ.

PLAGIOGYRIA. (Kunze Schkr. Supp. ii. 61.)

(Lomariæ sp. *auct.*;—Acrostichi sp. *Wallich.*;—Stenochlænæ sp. *auct.*)

Gen. char. *Sori* spuriously indusiate, marginal short oblong, the *receptacles* of the same form, terminal on the veins, contiguous, the obliquely-ringed spore cases becoming laterally confluent into a linear mass on each side of the costa of the contracted pinnæ. *Indusium* (spurious) formed of the inflexed attenuated margin. *Veins* simple or forked from a central costa; *venules* parallel free, their apices longitudinally soriferous in the fertile fronds. (Moore.)

Fronds pinnate, the fertile contracted-stipes furnished at the base with spongy glands and base of the pinnæ beneath sometimes furnished with a gland. The oblique ring to the spore cases is anomalous among the Polypodineæ and in this peculiarity the genus approaches the Cyatheineæ.

This genus is placed by most authors in the tribe Lomarieæ with which it has much natural affinity, and Sir W. Hooker makes it only a section of that genus. Mr. Moore however follows Kunze and Mettenius in separating it and points out that it can have no real structural affinity with Lomaria as the sori are arranged in short lateral contiguous lines along the ends of the veins and parallel with them as in Platylomeæ; whereas in Lomarieæ the receptacle of the sori is linear continuous and transverse to the venation.

PLAGIOGYRIA ADNATA (Blume) Caudex stout short, stipites cæspitose elongated brown triquetrous a span to 1½ foot long slender naked at the base dilated and subcarnose furnished with orbicular spongy glands, fronds a foot and more long, ovato-lanceolate chartaceo-membranaceous, *sterile* ones pinnatifid almost to the rachis below pinnated but all the pinnæ united by a narrow wing, segments mostly opposite distant lanceolate much acuminated more or less falcate, the inferior base round, superior base extended upwards the margins entire or obscurely toothed the apex strongly serrated, *fertile* fronds pinnated, pinnæ alternate distant linear sessile rather obtuse, sori covering the whole under side between the costa and the brown membranaceous very distinct involucre.—*Hook. Sp. Fil.* iii. 19.—*Bl. En. Fil. Jav. p.* 205.—Lomaria Griffithiana, *Hook. Herb.*;—Plagiogyria scandens, *Metten. in Plagiog. p.* 9 ?

The specimen figured is from the Khasya mountains, (Dr. Thomson.)

Hab. Java, Khasya Hills (elevation 1,000 to 4,000 feet.)

PLATE No. LI.

Plagiogyria adnata
(Bl.)

PLATYLOMEÆ.

PLAGIOGYRIA PYCNOPHYLLA (Kunze.) Caudex stout erect very woody and having many wiry roots, fronds fascicled, stipites sub-quadrangular 2-furrowed in front (as is the rachis) at the base dilated fleshy triquetrous subalate bearing spongy glands, fronds 1-2 and more feet long, *sterile* ones sub-chartaceous opaque brown when dry, oblong-ovate pinnated for its whole length except that the small terminal ones are confluent into a lobed (or pinnatifid) and finely acuminate and serrated apex, pinnæ horizontally patent sessile or very nearly so numerous approximate narrow oblong-lanceolate very finely almost caudately acuminate, the base very obtuse and truncate (neither dilated nor contracted) at the base beneath furnished with one or two prominent glands (sometimes wanting,) the margin very minutely serrulate, the caudate apex strongly serrated, veins numerous closely placed simple and forked, *fertile* fronds narrower pinnated, pinnæ linear obtuse on very short petioles with a gland on the under side, involucre at first vaulted conspicuous membranaceous brown at length forced back by the capsules.—*Hook. Sp. Fil.* iii. 21.—*Kze. in Bot. Zeit* iv. *p.* 143.—Acrostichum triquetrum, *Wall. Cat. n.* 23, *in part.*—Stenochlæna ? pycnophylla, *Pr. Epim. Bot. p.* 165.—Lomaria scandens, "*De Vriese in Herb. Kze.*"—L. callosa, *Fée Gen. Fil. p.* 70.—Plagiogyria adenophus.—*T. Moore. Ms.*

The specimen figured is from the Khasya Hills, (Dr. Thomson.)

Hab. Nepaul, Assam, Khasya, Bhotan, Sikkim, (7—15,000 feet), Java.

PLATE No. LII.

PLATE LII

Plagiogyria pycnophylla (Kunze)

PLEUROGRAMMEÆ.

GYMNOPTERIS. (See "Ferns of Southern India," p. 15.)

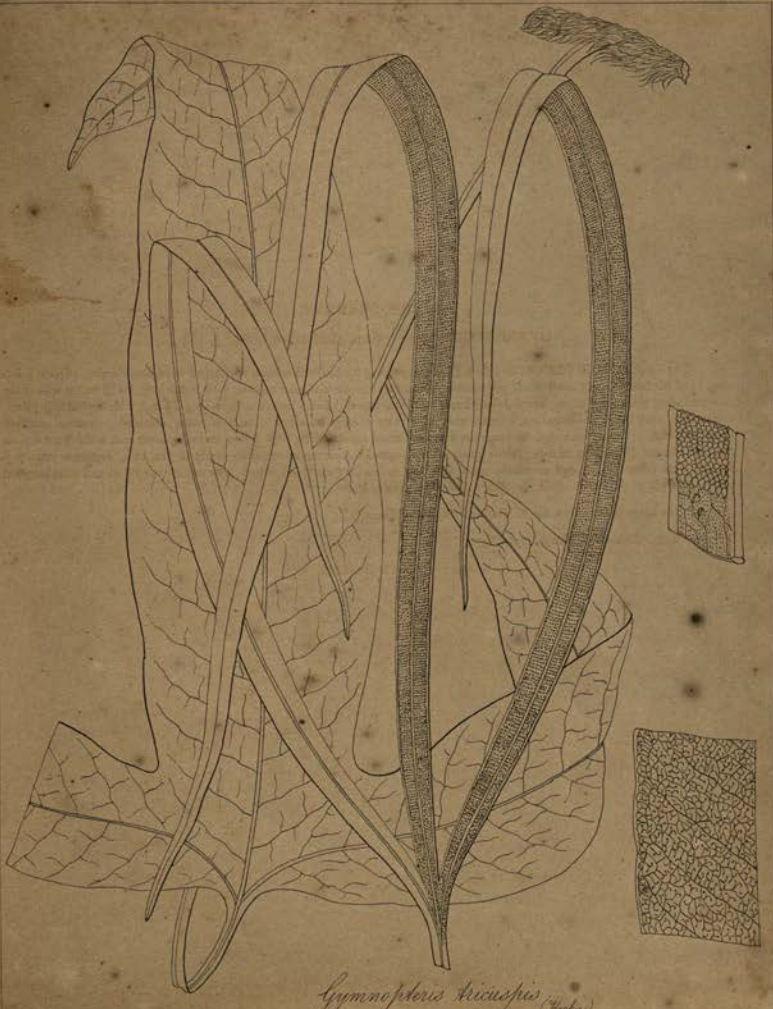
GYMNOPTERIS TRICUSPIS (Hook.) Caudex creeping clothed with subulato-setaceous ferruginous scales, stipites 1 foot long, 1½ of the fertile frond; *sterile* frond sub-coriaceo-membranaceous sub-triangular-cordate 8-10 inches long, 10-12 inches wide at the base, including the spread of the lateral lobes, deeply trilobate, lateral lobes 5 inches or more long, 1½ inch wide horizontally patent, intermediate one 6 inches and more long, 2 inches wide, all of them oblongo-lanceolate acuminate entire unicostate, venation manifest, costules distant indistinct connected by transverse irregular curved veins forming large areoles enclosing lesser ones which have copious free branched and divaricating veinlets; *fertile* fronds much elongated but contracted tripartite nearly to the base, segments scarcely ¼ an inch wide linear strap-shaped acuminate, lateral ones 9-10 inches long erecto-sub-patent, intermediate one a foot and more long, sori universal except on the costa.—*Hook. Sp. Fil.* v. 272.—Anapausia, *Moore.*

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Sikkim—Himalaya, (hot valleys.)

PLATE No. LIII.

PLATE LIII



Gymnopteris tricuspis (Hooker)

TÆNITIDEÆ.

Veins uniform reticulated, without free included veinlets.

TÆNITIS. (Willdenow. Swartz Synops Fil. 3-24.)

(Pteropsidis sp. *Desvaux ;*—Digramma *Kunze. ;*—Pteridis sp. *Auct. ;*—Antrophii *Sp. Auct.)*

Gen. char. *Sori* non-indusiate, linear, continuous or interrupted, the *receptacles* sub-marginal or medial superficial or somewhat immersed. *Veins* uniform reticulated forming elongated longitudinal or oblique areoles, without included free *veinlets.*

Fronds simple lobate or pinnate rigid, Rhizome creeping. (Moore.)

TÆNITIS BLECHNOIDES (Sw.) Caudex creeping nearly as thick as a writing-pen setose, stipites approximate 8-12 inches long, thickened and setose at the base, fronds 10 inches to 1 foot and more long (rarely when young, yet soriferous, simple) coriaceo-sub-membranaceous generally dimorphous pinnated, pinnæ a span or more long, entire at the margin ; *sterile* fronds with 5-7 broad-lanceolate suddenly acuminated pinnæ ; *fertile* pinnæ more numerous 15-16 linear-lanceolate gradually attenuated at the base, lower ones sessile, sori continuous or interrupted, veins copiously anastomosing, areoles oblique oblong veinless.—*Hook. Sp. Fil.* v. 187.—*Sw. Syn. Fil. pp.* 24 *and* 220.—*Willd. Sp. Pl.* v. *p.* 135.—*Bl. Fil. Jav. p.* 70 *t.* 28 *f.* 2 *and t.* 29.—*Fée. Vittar. p.* 26.—Tænitis pteroides, *Sckk. Fil. p.* 21 *t.* 6.—*Spreng. Analect.* iii. *p.* 374 *t.* 10 *f.* 106.—Pteris blechnoides, *Willd. Phytogr. p.* 13 *t.* 9 *f.* 3.—Var. *interrupta ;* much smaller, sori often interrupted. T. interrupta, *Wall. Cat. n.* 142.—*Hook. and Grev. Ic. Fil. t.* 62.

The specimen figured is from Burmah, (Rev. Parish.)

Hab. Malay Peninsular and Archipelago, Penang, Luzon, Borneo, Mergui and Tavoy, Singapore.

PLATE No. LIV.

PLATE LIV.

TÆNITIDEÆ.

DRYMOGLOSSUM. (See "Ferns of Southern India," p. 18.)

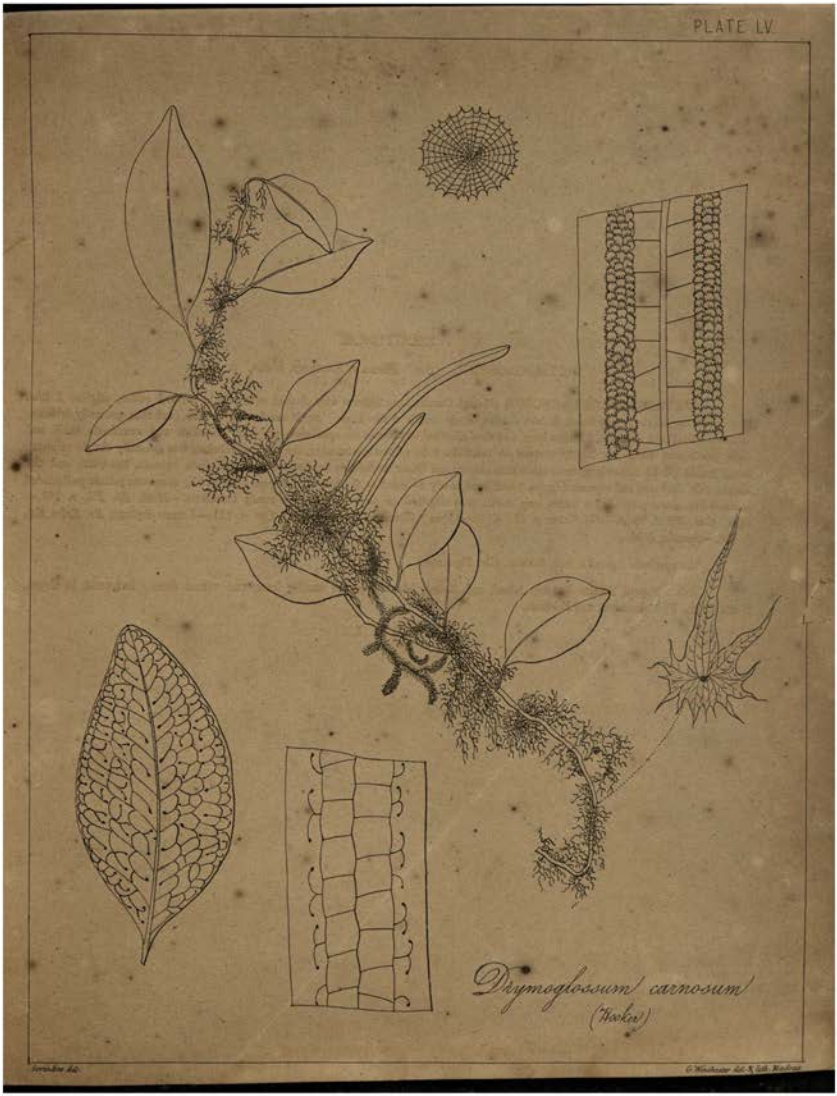
DRYMOGLOSSUM CARNOSUM (Hook.) Caudex long filiform wiry clothed with peltate toothed scales, stipites 2 lines to 1 inch long, (in the *fertile* frond) distant slender, fronds simple of two kinds; *sterile* one from ½ an inch, (and then generally orbicular or sub-cordate) to 2 and even 3 inches long, and then elliptical or obovate or spathulate or even lanceolate and acuminate thick and fleshy coriaceous when dry faintly costate on the under side, veins anastomosing, the areoles including free generally simple veinlets; *fertile* fronds 1-2·2½ inches long linear-spathulate obtuse, sori linear contiuuous forming a line intermediate between the costa and the margin soon confluent and representing one broad band nearly as broad as the frond, when young covered by numerous peltate pedicellated scales.—Var. *major*; fronds 1-2 inches long, sterile ones elliptical or obovate-spathulate rarely lanceolate.—*Hook. Sp. Fil.* v. 189.—*Hook. Gen. Fil. t.* 78. *A.*—*Fée Vittar. p.* 29.—Nothochlæna ? (Tænitis ?) carnosa, *Wall. Cat. n.* 131.—Lemmaphyllum, *Pr. Epim. Bot. p.* 158.—Tænitis, *Metten.*

The specimen figured is from Sikkim, (Dr. Thomson.)

Hab. Nepaul, Sikkim, Loochoo Island, and Kekeat Island, Japan, a smaller form (var. minor *Hook.*) is formed in Japan, North China, Fort Hamilton, and Formosa.

PLATE No. LV.

PLATE LV.



Drymoglossum carnosum
(Hooker)

VITTARIEÆ.

VITTARIA. (See "Ferns of Southern India," p. 6.)

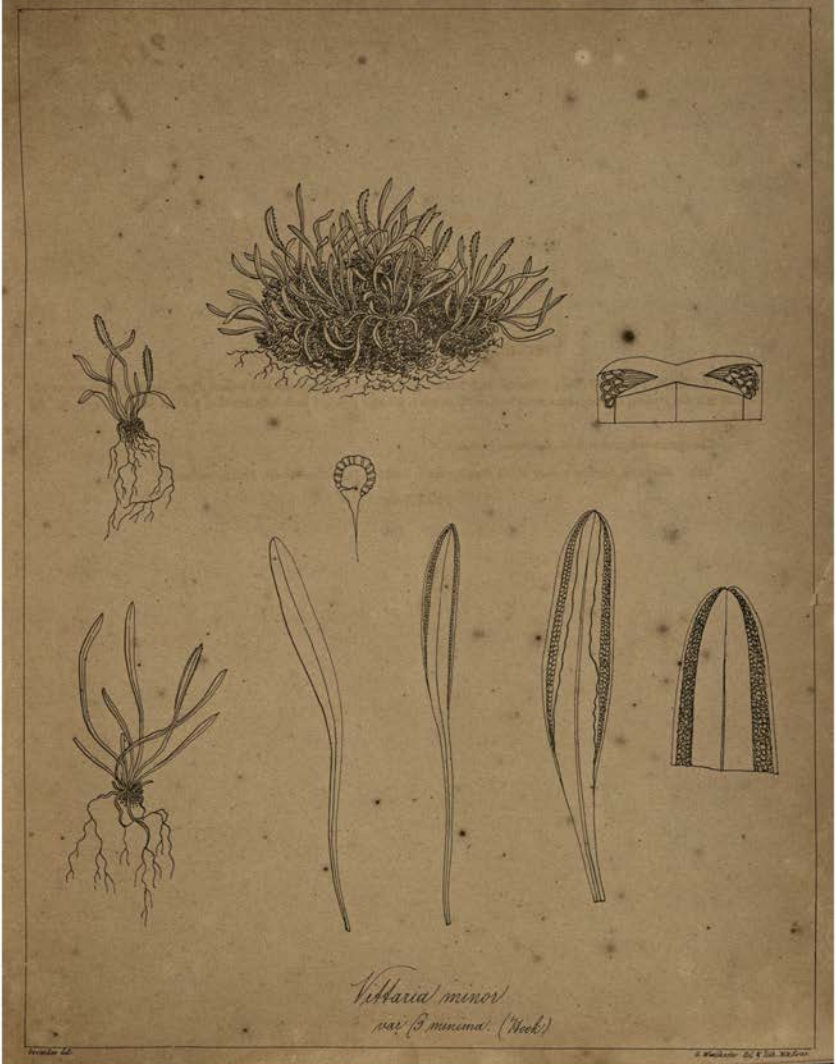
VITTARIA MINOR (Fée.) "Fronds linear costate obtuse tapering at the base into a short stipes, sori apicular broad exactly marginal in a deep sulcus, sporangiasters none."—Var. *β. minima*, Hook.; fronds 1 inch long less than ½ a line wide.—*Hook. Sp. Fil.* v. 183.

The specimen figured is from Moulmein, (Parish.)

Hab. Moulmein, another variety of the same species is found in Borneo and in the Philippine Islands.

PLATE No. LVI.

PLATE LVI.



Vittaria minor
var. β minima. (Hook.)

GYMNOGRAMMEÆ.

GYMNOGRAMMA. (See "Ferns of Southern India," p. 77.)

GYMNOGRAMMA JAVANICA (Bl.) (See "Ferns of Southern India," p. 77.)

The specimen here figured is from Dalhousie (Col. Dyas.,) it is very different in appearance to the Ceylon fern figured in Plate cexxxii. of this work, being much more compound and with smaller pinnæ it is the "*G. Javanica*" of Blume, the Ceylon plant being the "*G. serrulata*" of that author, Sir W. Hooker, however, considers the two only varieties of one species.

PLATE No. LVII.

PLATE LVII.

Gymnogramma Javanica (Bl.)

ASPLENIEÆ.

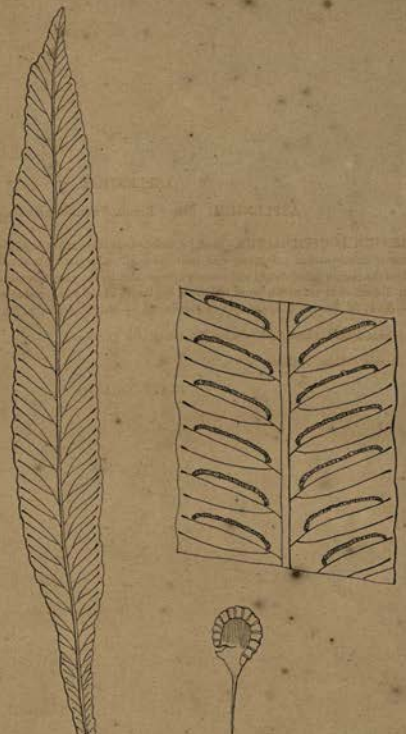
ASPLENIUM. (See "Ferns of Southern India," p. 42.)

ASPLENIUM GRIFFITHIANUM (Hook.) Caudex short thick sub-repent, fronds cæspitose a span to nearly a foot high, an inch in diameter sub-coriaceous pale-green with scattered small scales lanceolate shortly acuminate tapering gradually below into a short winged stipes the margin rather deeply and coarsely crenato-serrate, the narrow acumen excepted, veins rather distant sub-horizontally patent, sori distant short and rather broad two-thirds the length of the vein, involucres pale-coloured firm-membranaceous.—*Hook. Sp. Fil.* iii. 87.—*Hook. Ic. Plant. t.* 928, *(or Cent. of Ferns t.* 28.*)*—*Metten. Asplen. p.* 89.

The specimen figured is from Sikkim below Darjeeling, (Dr. Thomson.)

Hab. Assam, Sikkim, Mishmee.

PLATE No. LVIII.



Asplenium Griffithianum
" (Hook.)

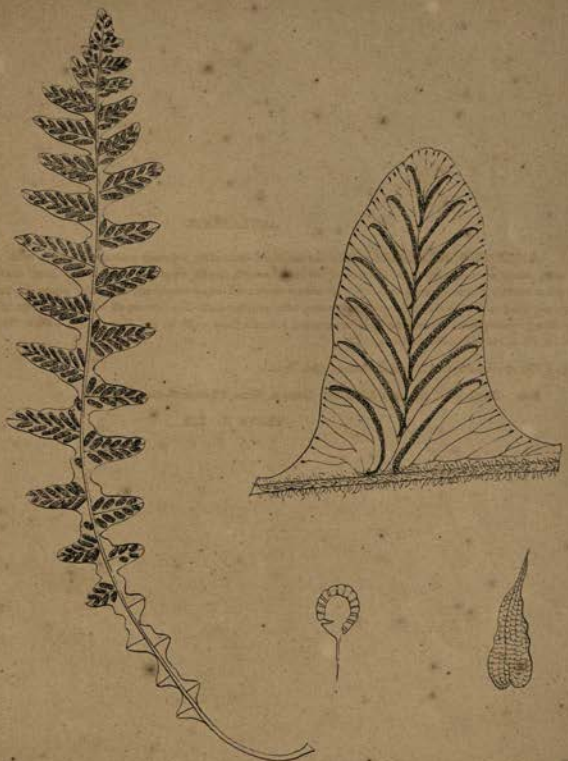
ASPLENIEÆ.

ASPLENIUM ALTERNANS (Wall.) Caudex short descending copiously rooting squamose with subulate scales as is the very short (rarely an inch long,) stipes and base of the costa beneath, fronds cæspitose about a span long, chartaceous very opaque pale-rusty green beneath glabrous lanceolate scarcely acuminate attenuated below deeply and regularly pinnatifid throughout, lobes ovate or triangular-oblong with wide sinuses obtuse quite entire, veins sub-flabellato-dichotomous all free, sori copious on all the lobes in two rows linear-oblong erecto-patent, the superior basal one parallel with the costa.—*Hook. Sp. Fil.* iii. 92.—*Wall. Cat. n.* 221.—A. Dalhousiæ, *Hook. Ic. Pl. t.* 105.—*Metten. Asplen. p.* 147.

The specimen figured is from Dalhousie, (Col. Dyas.)

Hab. North West, Himalaya 6,000 feet, Kumaon, Simla, Chumbra hill—Abyssinia.

PLATE No. LIX.



Asplenium alternans
(Wall.)

ASPLENIEÆ.

ASPLENIUM SEPTENTRIONALE (Sw.) Small caudex creeping densely radiculose scarcely paleaceous, stipites numerous tufted 3-6 inches high, erect flexuose green brown at the base, fronds 1-2 inches long, coriaceous glabrous pinnated pinnæ ¾-1 inch long, long-petioled linear or linear-lanceolate subunguiculate often very acute or acuminate rarely solitary generally 2-3 alternate entire or forked, lateral segments small subulate rarely laciniated (2-3 acuminate segments), veins forked parallel, sori very ong, involucres also much elongated attached near the margin.—*Hook. Sp. Fil.* iii. 174.—*Sw. in Schrad. Journ.* ii. *p.* 283.—*Willd. Sp. Pl.* v. *p.* 307.—*Schk. Fil. p.* 62. *t.* 65.—*Engl. Bot. t.* 1,017.—*Metten. Asplen. Fil. Hort. Lips. p.* 76 *t.* 13 *f.* 21.—Moore, *Ferns Nat. Print t.* 41 c.—*Metten. Asplen. p.* 141.—Acropteris, *Link. Fée. Gen. Fil. p.* 77, *t.* 6. *A. f.* 1.—Amesium, *Nesrn.*—Acrostichum, *Linn. Sp. Pl. p.* 1,524.

Hab. Northern India, Kashmir, (elevation 9,000 feet.) Garhwal, (elevation 11,000 feet.) Europe from Norway the extreme South, Caucasus, Ural and Altai—New Mexico.

PLATE No. LX.

Asplenium septentrionale
(Sw)

ASPLENIUM.

ASPLENIUM RUTA-MURARIA. (L.) Small, caudex short very fibrous indistinctly paleaceous, stipites tufted 2-5 inches long slender green purple below, fronds subcoriaceous about as long as the stipes deltoid bi-tripinnate, pinnules obovate or cuneate (when young simple and reniform) obtuse or truncated entire or cleft or incised at the apex, veins flabellate dichotomous, sori linear crowded sometimes elongated crowded, involucres broad erose at the margin.—*Hook. Sp. Fil.* iii. 176.—*Linn. Sp. Pl. p.* 1,541.—*Sm. Engl. Bot. t.* 150.—*Sw. Syn. Fil. p.* 85.—*Willd. Sp. Pl.* v. p. 75 *t.* 80 *B.*—*Moore Fil. Brit. Nat. Print t.* 41 *A.*—*Metten. Fil. Hort. Lips. p.* 143. —*Asplen. p.* 143.—**A.** murorum, *Law.* A. murale, *Bernh. Aspl.* multicaule, *Pr.* A. Matthioli, *Gasp. et. Guss.* Scolopendrium, *Roth.* Amesium, *Newm.* Tarachia, *Pr.*

The specimen figured is from Kashmir.

Hab. Throughout Europe, North Asia, Kashmir, Thibet, &c., Cape, Algeria, N. America.

PLATE No. LXI.

Asplenium Ruta-muraria
(L.)

ASPLENIUM.

ASPLENIUM ADIANTUM-NIGRUM. (L.) Caudex stout (old ones thickly clothed with the remains of old stipites) horizontal, stipites densely tufted castaneous and generally ebeneous at the base often a span and more long, frond a span to a foot and more long ovate or ovato-oblong acuminate firm membranaceo-coriaceous intent bi-tripinnate, primary pinnæ petiolate ovato-acuminate, secondary also petiolate, tertiary usually sessile from a cuneate base ovate or oblong or lanceolate or even linear more or less acuminate but obtuse inciso-pinnatifid lobes coarsely and sub-spinuloso-serrate, veins pinnated erecto-patent, sori copious approximate linear-oblong at length confluent, involucres firm-membranaceous pale brown entire, rachises alate.—*Hook. Sp. Fil.* iii. 187.—*Linn. Sp. Pl. p.* 1,541.—*Sw. Syn. Fil. p.* 84.—*Willd. Sp. Pl.* v. *p.* 346.—*Schk. Fil. p.* 74 *t.* 80 *A.*—*Engl. Bot. t.* 1,950.—*Metten. Asplen. p.* 144.—*Moore Ferns. Nat. Print t.* 36.—*Moore Ind. Fil. p.* 109.—A. Oreopteris, L. (according to Moore; but Mettenius refers this to the var. *acutum*). A. argutum, *Kifs. En. Fil. p.* 176;—A. humile, *Bl. En. Fil. Jav. p.* 185;—A. Silesiacum, *Milde*;—A. nigrum, *Bernh.*;—A. Juridum, *Salisb.*;—A. capense, L. *(fide Moore)* Tarachia, Pr.—Var. *β acutum*, Pollin.; pinnæ pinnules and segments narrower often linear acute or acuminate. *Moore Brit. Ferns. Nat. Print t.* 37;—A. acutum *Bory, in Willd. Sp. Pl.* v. *p.* 347;—A. productum, *Lowe, Trans. Cambr. Phil. Soc.* vi. *p.* 524.—Var. *γ obtusum*, Moore; pinnules and lobes very broad more acutely dentate;—A. Ad. nigr. v. Capense, *Schlecht. Adumbr. Fil. Cap. p.* 31 *t.* 18;—A. obtusum, *Kit. Willd. Sp. Pl.* v. *p.* 341;—A. cuneifolium, *Vis. Fil. Ital. Fragm. p.* 16 *t.* 18;—A. Serpentini, *Tausch. and Henfl. Aspl. Europ. p.* 81 *t.* 1, 2.—Mr. Moore refers hither, A. fissum, *Weinm.*;—A. forsteri and A. novum, *Sadl.*;—A. incisum, *Opiz*;—A. multicaule, *Scholtz.* and A. tabulare, *Schrad.*

The specimen figured is from Simla.

Hab. All three varieties are found throughout Europe and Northern Asia, N. and S. Africa, Madeira, the Canaries, Azores, Cape de Verd Islands, St. Helena, Abyssinia, Java. In Northern India they are found in Afghanistan and at Mussoorie, Kashmir, and Simla.

PLATE No. LXII.

Asplenium Adiantum nigrum
(L.)

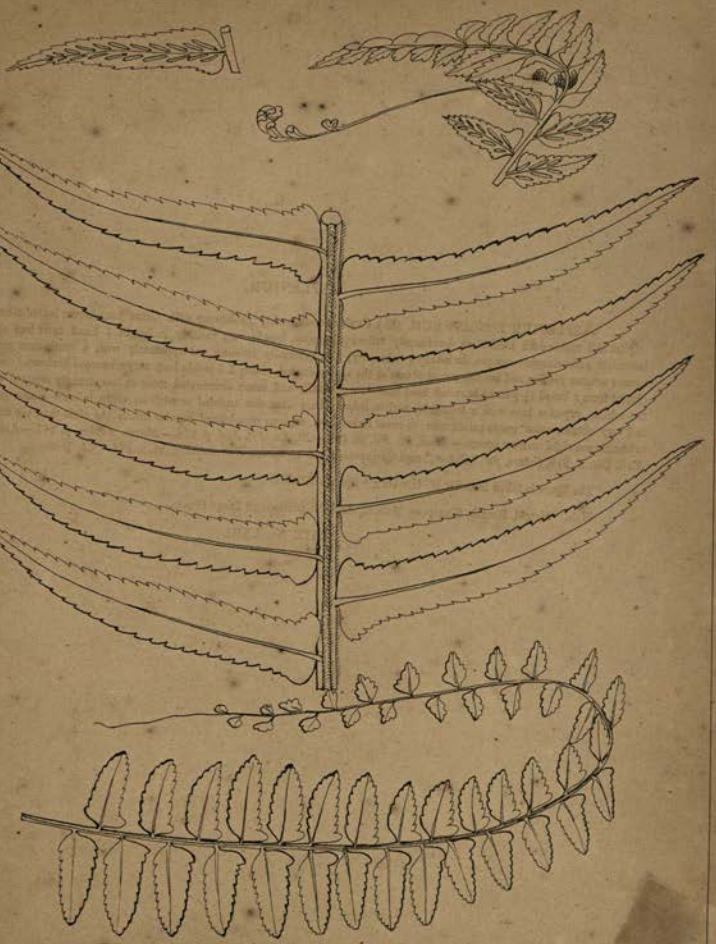
ASPLENIUM.

ASPLENIUM LONGISSIMUM. (Bl.) Caudex stout woody paleaceous with rather long brown lanceolato-subulate scales, stipites and rachis dark lurid-black deciduously villoso-paleaceous, fronds very variable in length 1-3 and more feet elongato-oblong-lanceolate subcoriaceous opaque dark-brown (when dry) the extremity running out apparently with a continuous growth to a long narrow acumen rooting and bearing young plants at the apex pinnated, pinnæ 3-4 inches long very numerous horizontal sessile moderately distant from a broad (½-¾ inch) cuneated base lanceolate gradually and much acuminated more or less strongly serrated especially above the middle, superior base with a triangular auricle, inferior base often also auricled or with an angle, inferior pinnæ gradually smaller and very obtuse, veins erecto-patent once or twice forked, sori copious close-placed regular nearer the costa than the margin, involucre subcoriaceous rigid narrow brown.— *Hook. Sp. Fil.* iii. 148.—*Bl. En. Fil. Jav. p.* 178.—*Metten. Asplen. p.* 147.—Aspl. flagelliferum, *Wall. Cat. n.* 219, (*where, for* "Sylhet," read Singapore) Aspl. sordidum, *Kze. Bot. Zeit.* vi. *p.* 174, (*fide Metten.*).

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Mergui, Birmah, Singapore, Malacca, Java, Mauritius, and Diego Garcia.

PLATE No. LXIII.



Asplenium longissimum
(Blume)

Verschoor del. F. Winkler del. & lith. Wien

ASPLENIUM.

ASPLENIUM VIRIDE. (Huds.) Caudices short creeping clothed with black subulate scales forming a closely compacted rooting mass, stipites densely coespitose 2-4 inches long slender glossy black below then castaneous nearer the fronds stramineous, fronds 3-5 rarely 6 inches long linear-lanceolate membranaceous bright-green (as is the slender rachis) glabrous scarcely acuminated pinnated, pinnæ 2-3 lines long rather distant pinnate all petiolate rhombeo-ovate obtuse more or less obliquely cuneate at the base deeply but rather irregularly crenate. Scarcely at all lobed, veins sub-flabellate, sori 2-4 near the disc remote from the margin oblong oblique at length confluent, involucres very thin membranaceous soon obliterated.—*Hook. Sp. Fil.* iii. 144.—*Huds. Fl. Ang.* p. 453.—*Sw. Syn. Fil. p.* 80.—*Willd. Sp. Pl.* v. *p.* 332.—*Schk. Fil. p.* 68 *t.* 73.—*Eng. Bot. t.* 392.—*Moore and Lindl. Ferns, Nat. Print t.* 40.—*Mutten. Asplen. p.* 139 ;—A. Trichomanes, var. ramosum, *Linn. Sp. Pl. p.* 1,541 ;—A. intermedium, *Pr. Del. Prag.* 1·233,—*Tent. Pterid. t.* 3. *f.* 22 ;—A. umbrosum, *Vill.*

Hab. Throughout Europe, Himalayas, Kumaon (alt. 12,000 feet), N. America.

PLATE No. LXIV.

Asplenium viride
(Huds.)

ASPLENIUM.

ASPLENIUM BULBIFERUM. (Forst.) Caudex stout horizontal or oblique paleaceous with long linear-subulate scales at the summit, stipites lurid-green 4 inches to a foot long sometimes deciduously and sparsely paleaceous semiterete or broad and compressed, fronds sub-coriaceo-membranaceous, yet flaccid 1-3 feet long ovato-lanceolate erect or pendulous dark-green pinnato-pinnatifid with lobes entire or toothed or usually bi-rarely tripinnate, primary pinnæ often proliferous 6 inches long petiolate more or less lanceolate acuminated, pinnules in the normal form from ½ an inch to 2 inches long elliptical-ovate and more or less pinnatifid with ewasplenioid sori, or the pinnules are narrower elongated deeply divided, and the majority of them quite dareoid, sori oblique, involucres firm greenish, rachises compressed.—*Hook. Sp. Fil.* iii. 196.—*Forst. Prodr. p.* 80.—*Sw. Syn. Fil. pp.* 83 *and* 278.—*Schk. Fil. t.* 79.—*Hook. Ic. Pl. t.* 423.—*Hombr. et. Jacq. Voy. Pôl. Sud. Bot. t.* 3. *f.* 1.—*Hook. fil. Fl. N. Zeal.* ii. *p.* 34.—*Fl. Tasm.* ii. *p.* 146.—*Metten. Asplen. p.* 106.—*Moore Ind. Fil. p.* 118 ; Cænopteris, *Desv.* ;—Aspl. viridans, *Labill. Sert. Aust. Caled.* i. *p.* 2 *t.* 2 ;—*Metten. Asplen. p.* 107 ; —A. bullatum, *Wall. Cat. n.* 215 ;—Athyrium macrocarpum, *Fée. Gen. Fil. p.* 188 ;—Asplen., *Moore.*

The specimen figured is from Sikkim (Dr. Thomson), the plate has been named A. bullatum (Wall.), and should be altered to A. bulliferum. Forst, as that is an older name.

Hab. New Zealand, Australia, Nepaul, Sikkim, Bhotan, Penang, South America.

PLATE No. LXV.

Asplenium bullatum
(Will)

ASPLENIEÆ.

THAMNOPTERIS. (See "Ferns of Southern India," p. 42.)

THAMNOPTERIS GREVILLEI. (Wall.) Fronds tufted subcoriaceous 1½ foot long pale-whitish-green when dry, spathulate (or oblong-ovate finely acuminate suddenly contracted at the base and decurrent upon a long winged stipes) veins compact horizontally patent, sori linear very narrow occupying the upper half or the entire broad portion of the frond rather distant.—*Hook. Sp. Fil.* iii. 80. —*Wall. Cat. n.* 1,036.—*Hook. et. Grev. Ic. Fil. t.* 128.—*Moore, Ind. Fil. p.* 50.

The specimen figured is from Birmah, (Captain the Honorable J. Dormer.)

Hab. Birmah, Tavoy, Mishmee.

PLATE No. LXVI.

Thamnopteris Grevillei
(Wall)

ASPLENIEÆ.

ATHYRIUM. (See "Ferns of Southern India," p. 50.)

ATHYRIUM OXYPHYLLUM. (Hook.) Caudex very stout 1-2 inches in diameter ascending clothed with numerous persistent stipites of former years villous rather than paleaceous at the summit with very long (½ of an inch) erect subflexuose ferruginous scales, stipites clustered 4 inches to a foot long stramineous glossy below shaggy with the same scales as crown the caudex, fronds 6-18 inches long from broad-lanceolate to sub-deltoideo-ovate subcoriaceous generally much acuminated bi-rarely tri-pinnate, primary pinnæ 3-8 inches in length often flexuose from a broad base lanceolate sometimes spinulose on the costa above generally much acuminated and sharply serrated only at the apex, pinnules from an oblique cuneated base tapering into a distinct petiolule ovato-lanceolate acute lobato-pinnatifid at the margin auricled at the superior base serrated towards the apex, the lobes usually acute, sometimes the pinnules are again pinnated, veins pinnated, sori in two rows one on each veinlet near the middle, varying much in size rarely straight mostly curved or crescent-shaped, involucres often hippocrepiform brown membranaceous erose or fringed at the margin sometimes deciduous.—*Hook. Sp. Fil.* iii. 221 ;—Polypodium oxyphyllum, *Wall. Cat. p.* 324 ;—Athyrium, *Moore Ind. Fil. p.* 126 ;—Aspidium eburneum, *Wall. Cat. p.* 389 ;—(pinnæ and pinnules more slender), Asplenium, *J. Sm. Cat. Cult. Ferns p.* 6.—*Metten. Asplen. p.* 194 ; —Lastrea, *J. Sm. Cat. Cult. Ferns p.* 47 ;—Aspidium squarrosum, *Wall. Cat. n.* 356 ;—(Moore refers this to his *Athyrium falcatum*). —Polypodium drepanopterum, *Kze. in Linnæa.* xxiii. *p.* 318 ;—Aspidium, *Braun. Ind. Sem. Berol.* 1856.—*Metten Fil. Hort. Lips.* p. 93. *t.* 19. *f.* 1-4.

The specimen figured is from the Khasya Hills, (Dr. Thomson.)

Hab. Nepaul, Assam, Khasya, Eastern Himalaya, Bhotan.

PLATE No. LXVII.

Athyrium axyphyllum
(Wall.)

ASPLENIEÆ.

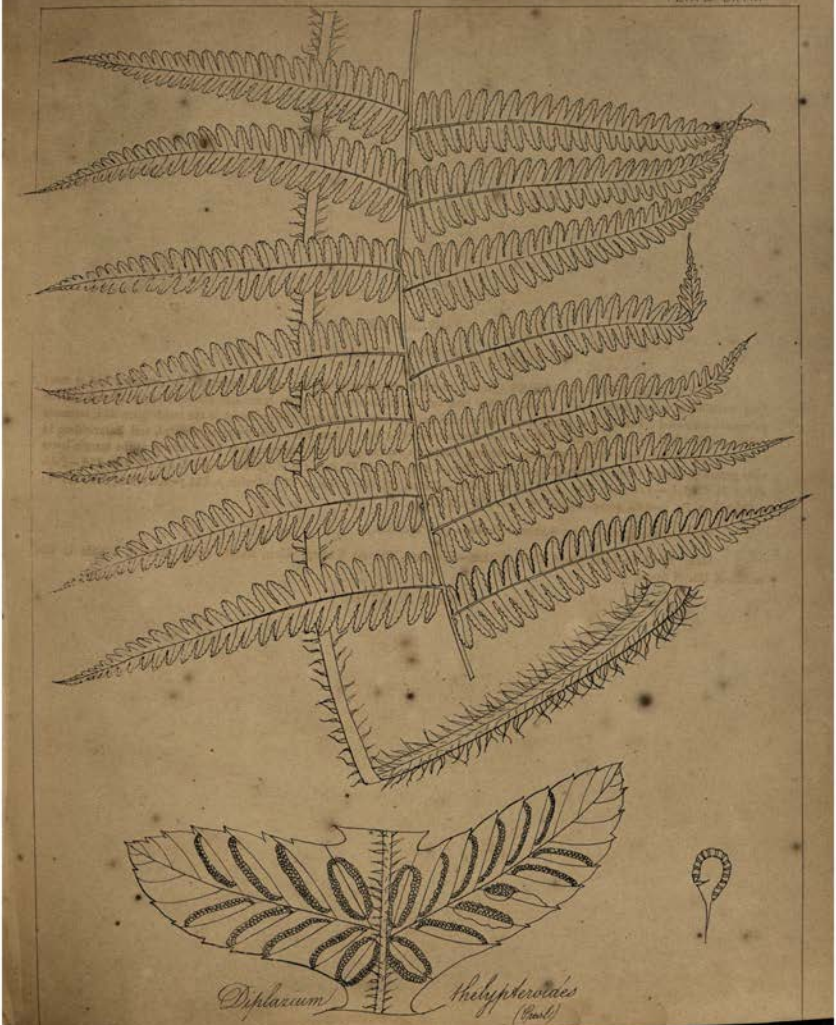
DIPLAZIUM. (See "Ferns of Southern India," p. 53.)

DIPLAZIUM THELYPTEROIDES. (Mich.) Caudex stout creeping, stipites rather distant on the caudex a foot or more long stramineous glossy brown below, fronds 1-3 feet long submembranaceous dark-green lanceolate-acuminate firm pinnate, pinnæ subremote horizontal 3-4 inches long sessile from a broad base linear-oblong acuminated deeply almost to the rachis pinnatifid, segments oblong-elliptical ½ of an inch long horizontal entire or obscurely serrated very obtuse, veins mostly simple-pinnated, sori linear-oblong in two series approximate upon the segments soon confluent, involucres convex pale firm-membranaceous entire convex at the margin lower ones generally double, rachis stramineous.—*Hook. Sp. Fil.* iii. 229.—*Mich. Fl. Bor. Am.* ii. *p.* 265.—*Willd. Sp. Pl.* v. *p.* 336.—*Schk. Fil. p.* 71. *t.* 76. *b.*—*Asa. Gray, Man. B. N. U. St. p.* 627.—*Metten. Fil. Hort. Lips. p.* 78.—*Asplen. p.* 184 ;—Athyrium, *Desv. Moore* ;—Diplazium, *Pr.* ;—Aspl. acrostichoides, *Sw. Syn. Fil. p.* 275.

The specimen figured is from Sikkim—Himalaya, (Dr. Thomson.)

Hab. Northern India above Simla, Sikkim—Himalaya, Chinese Tartary, River Amur, North America, Canada to the middle of United States.

PLATE No. LXVIII.


Diplazium
thelypteroides
(Desv.)

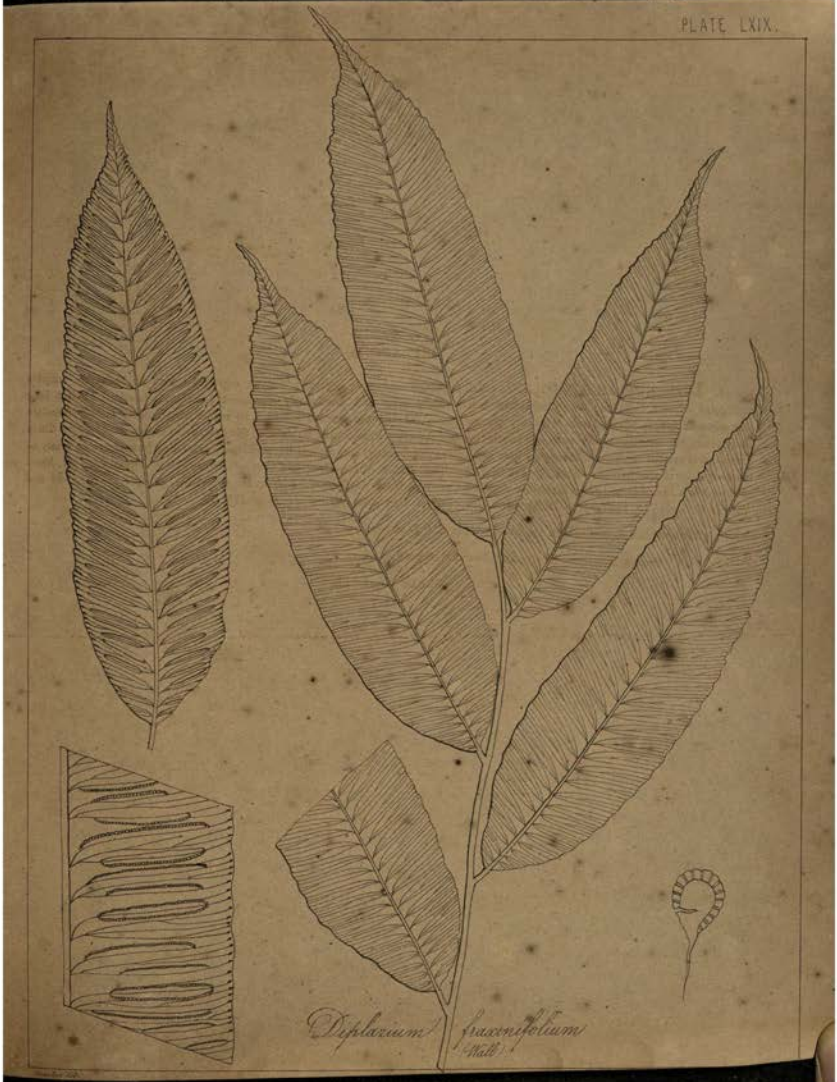
DIPLAZIUM.

DIPLAZIUM FRAXINIFOLIUM. (Wall.) Caudex ascending copiously fibrous nigro-paleaceous at the apex, stipites aggregated often a foot long brown subrobust below chiefly laxly and deciduously nigrescenti-paleaceous, fronds 1-1½ foot long subcoriaceous firm subnitent brown when dry pinnate, pinnæ 3-11 remote petioled patent 6-10 inches long broadly oblong-lanceolate finely acuminate entirely or very obscurely serrate towards the apex subobliquely cuneate at the base, veins fasciculate twice or thrice dichotomous parallel copious all free (rarely here and there anastomosing) sori copious linear-elongate extending from the costa nearly to the margin, involucres narrow.—*Hook. Sp. Fil.* iii. 240.—*Wall. Cat. n.* 194.—*Hook. 2nd Cent. of Ferns t.* 19;—Diplazium, *Wall. Herb.* 1823.—*Moore Ind. Fil. p.* 133;—Diplazium elegans (*veins free*), *Hook. in Kew. Gard. Misc.* ix. *p.* 343.—*C. Wright, in Ringgold and Rogers's Herb of U. S. expl. exp.*;—D. falcatum, *Don. ?*—Aspl. Donianum, *Metten. Asplen. p.* 178.

The specimen figured is from the Khasya Hills, (Dr. Thomson.)

Hab. Penang, Singapore, Khasya and Assam, Hongkong.

PLATE No. LXIX.


Diplazium fraxinifolium (Wall.)

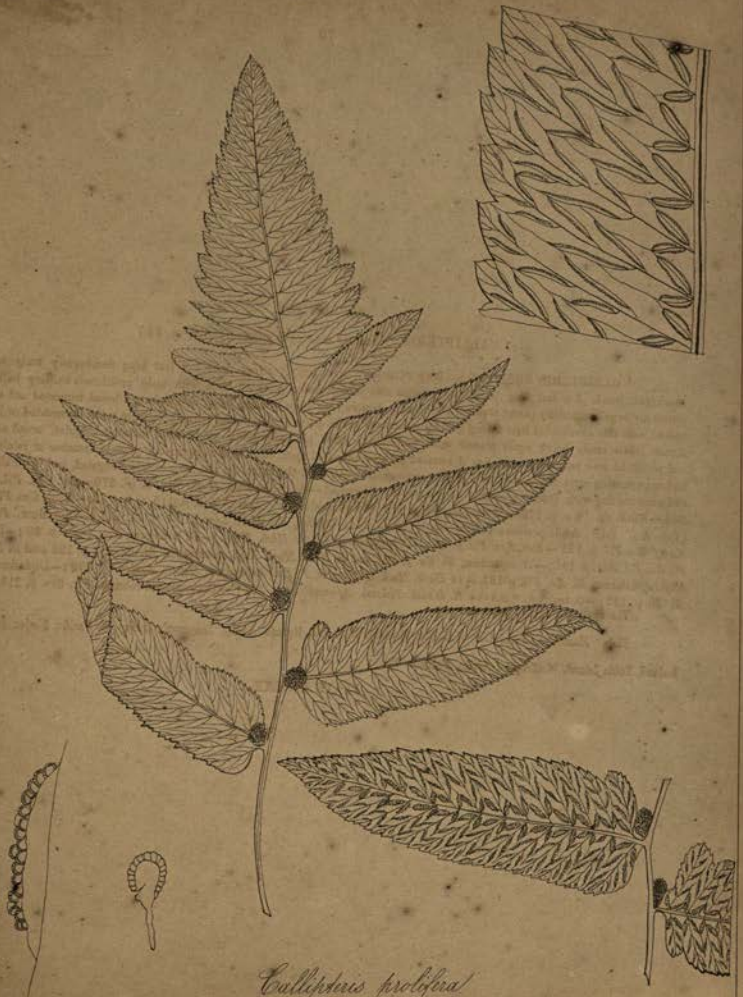
ASPLENIEÆ.

CALLIPTERIS. (See "Ferns of Southern India," p. 54.)

CALLIPTERIS PROLIFERA. (Bory.) Caudex "erect scaly," stipes stout 1-2 feet long deciduously scaly smooth or muricated, fronds 2-4 feet long broad-oblong acuminate subcoriaceous pinnated often with scaly proliferous axillary bulbs, pinnæ numerous large horizontally patent sessile 6-10 inches and more long often 2 inches broad sessile from a broad truncated and subcordate and on each side subauricled base oblong gradually narrower to the acute or acuminated apex, the margin entire or serrated or irregularly sinuato-lobate rarely below again pinnate with oval-oblong acute pinnæ, terminal pinnæ large hastato-triangular, broad at the base and pinnatifid with long segments entire or serrated at the acuminated apex, veins copious fasciculato-pinnate branches or veinlets uniting and anastomosing more or less copiously, forming triangular areoles next the costæ, the rest more or less elongated, sori upon all the veins and anastomising with them, involucres narrow mostly diplazioid.—A. decussatum, *Hook. Sp. Fil.* iii. 270.—*Sw. Syn. Fil. p.* 76 *and* 260.—*Willd. Sp. Pl.* v. *p.* 173.—*Metten. Asplen. p.* 173 ;—Anisogonium, *Pr. Tent. Pterid. p.* 116. *t.* 4. *f.* 13.—*Hook. Gen. Fil. p.* 56.—(Tab. A. *f.* 1-4). Aspl. proliferum, *Lam. Wall. Cat. p.* 236.—*Mettea. Fil. Hort. Lips. p.* 74. *t.* 11. *f.* 7 ;—Diplazium, *Petit.* ;—Th. *Kaulf. En. Fil. p.* 182.—*Sieb. Syn. Fil. p.* 30 ;—D. bulbiferum, *Boj. in Herb. Hook.* ;—D. horridum, *Kze. Annal p.* 26 ;—D. Swartzii, *Bl. En. Fil. Jav. p.* 191 ;—D. repandum, *Bl. En. p.* 191 *and in Herb. Hook.* Aspl. spinulosum, *Bl. En. Fil. p.* 193 *and in Herb. Hook.* Aspl. spinulosum, *Bl. En. Fil. p.* 193. *et in Herb. Hook.* Callipteris, *J. Sm.* Asplenium, *Metten. Asplen. p.* 172 ;—Diplazium accedens, *Bl. En. p.* 192 ;—D. incisum, "*Schuhn R. Dansk. Vidensk. Afhandl.* iv. *p.* 232 ;"—Digrammaria robusta, *Fée. Gen. p.* 218. *t.* 18. *B.*
The specimen figured is from Assam.

Hab. Mauritius, Java, Isle of Leyte, Ternate, Moluccas, Borneo, Assam, Solomon's Group, S. Pacific, Feejee Islands, New Ireland, Tobie Island, W. Tropical Africa, Fernado Po.

PLATE No. LXX.



Callipteris prolifera
(Bory)

ASPLENIEÆ.

* * * * *Veins reticulated with marginal veinlets free.*

CETERACH. (Willdenow, Sp. Pl. v. 136.)

(Ceterach, *Adanson*; Notolepeum, *Newman*; Acrostichi Sp., *Cavanilles*; Asplenii Sp., *Auct.*; Grammitidis Sp., *Auct.*; Gymnopteridis Sp., *Bernhardi*; Scolopendrii Sp., *Symons*; Vittariæ Sp., *Bernhardi*; Gymnogrammatis Sp., *Sprengel* Sp.; Blechni Sp. *Auct.*)

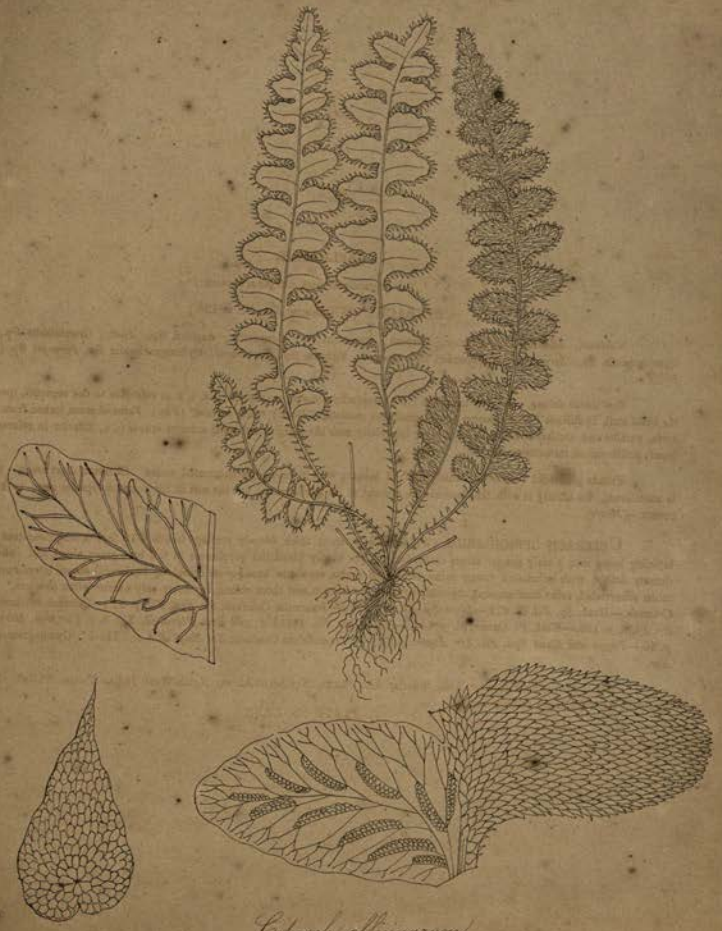
Sori linear oblong, obsoletely indusiate; the receptacles lateral, usually anterior, *i. e.* in reference to the segment, (posterior in the basal sori), *Indusium* "linear narrow plane, sometimes obsolete," (*Hook.*) "thin narrow," (*Fée.*) *Veins* obscure, forked from a central costa, parallel and soriferous below, anastomosing irregularly near the margin, the basal anterior *venule* (*i. e.*, anterior in reference to the frond) soriferous on its anterior side.

Fronds pinnatifid coriaceous, densely clothed beneath with membranous imbricated scales. Rhizome short erect. This genus is anomalous. Its affinity is with the *Aspleniæ* on account of its lateral sori; but the sori in the common species seem to be without covers.—(*Moore*).

CETERACH OFFICINARUM. (Willd.) Caudex short thick densely rooting, fronds 6-10 inches long cæspitose lanceolate tapering below into a scaly slender stipes coriaceous opaque deeply pinnatifid subpinnate at the base green above and naked beneath densely clothed with imbricated tawny entire or toothed scales, segments broad-ovate or oblong horizontal obtuse lower ones or pinnæ much abbreviated, veins anastomosing copiously towards the margin, sori short oblong, involucre very narrow often obsolete. Asplenium Ceterach.—*Hook. Sp. Fil.* iii. 273.—*Linn. Sp. Pl. p.* 1,538;—Grammitis Ceterach, *Sw. Syn. Fil. p.* 23;—Ceterach officinarum, *Willd. Sp. Pl.* v. *p.* 136.—*Webb. Fl. Canar.* iii. *p.* 443.—*Hook. Gen. Fil. t.* 113 *A, and Brit. Flora, ed.* 7. *t.* 9. *f.* 1.—*Mett. Hort. Fil. Lips. p.* 80.—*Pappe and Rawz Syn. Fil. Afr. Austr. p.* 23;—Scolopendrium Ceterach, *Sm. Engl. Bot. t.* 1,244-1. Gymnogramme Ceterach, *Spr.*

Hab. Throughout Europe, Asia, Siberia, Asia Minor, Northern Africa, North-West India, Persia, Thibet, Afghanistan, Kashmir, Azores, Canary Islands, Brazil.

PLATE No. LXXI.



Ceterach officinarum
(Willd)

ASPLENIEÆ.

HEMIDICTYUM. *(Presl. Tent. Pterid.* 110*).*

(Asplenidictyon, *J. Smith* ; Asplenii Sp., *Auct.* ; Tarachia Sp., *Presl.* ; Diplazii Sp., *Hort.*)

Sori indusiate, linear elongate, parallel, oblique ; the *receptacles* lateral anterior. *Indusium* narrow, membranaceous, plane. *Veins* simple or forked from a central costa ; *venules* parallel at the base, reticulated towards the margin, forming trapezoid or elongated areoles, the apices arcuately combined, or connected by a continuous straight marginal *veinlet*.

Fronds coriaceous or thin herbaceous, pinnate, sometimes large. Rhizome thick erect.—(*Moore*).

HEMIDICTYUM FINDLAYSONIANUM. (Wall). Caudex erect stout woody scaly at the summit rooting below, stipites and rachis compressed deciduously scaly below, fronds 1-1½ foot long coriaceous (brownish-green when dry) oblong pinnate, pinnæ remote 5, 16 or 17, erecto-patent inequilaterally and subfalcately ovato-lanceolate long acuminate entire or sinuato-subangulate subauriculate unequally cuneate at the base and gradually attenuated into the petiole scarcely costate, terminal one subrhomboid unequally 3-lobed, veins subflabellate diverging from an indistinct costa dichotomous free below anastomosing towards the margin into very elongated subhexagonal areoles, terminal veinlets free or rarely combined in arches at the margin, sori linear elongated but varying much in length, originating at the centre but never extending to the margin, involucres narrow.—*Hook. Sp. Fil.* iii. 271.—*Wall. Cat. n.* 191.—*Hook. Ic. Plant. t.* 937 ; (*veinlets too copiously arched at the margin*) ;—A. integerrimum, *Wall. Ms.*—*Hook. et Grev. Ic. Fil. t.* 136 ; (*inaccurate in the venation*) ;—Hemidictyum Finlaysonianum, *Moore Ind. Fil. p.* 1 ;—H. Hookerianum, *Moore Ind. Fil. p.* 130 ; (*who quotes* A. Hookerianum, *Wall. Cat. n.* 2,682.)

The specimen figured is from the Khasya Hills, (Dr. Thomson).

Hab. Penang, Mishmee, Sikkim, Khasya, Assam, Nepaul, Kumaon.

PLATE No. LXXII.

Hemidyction Findlaysonianum
(Wall.)

POLYPODIEÆ.

Margins of the fronds revolute, indusioid (i. e., the sori spuriously indusioid).

ALLOSORUS. *Bernhardi, Schrad neues Journ. Bot.* 1. *pt.* 2. 5. 36. *t.* 2. *f.* 6.

(Allosorus, *Auct.*; Phorolobus, *Desvaux*; Homopteris, *Ruprecht*; Pteridis Sp., *Auct.*; Cryptogrammatis Sp., *Auct.*; Struthiopteridis Sp., *Auct.*; Steganiæ Sp., *Auct.*; Onocleæ Sp., *Auct.*; Osmundæ Sp., *Auct.*; Blechneæ Sp., *Auct.*; Acrostichi Sp., *Auct.*; Chelanthis Sp., *Auct.*; Onychii Sp., *Fée*).

Sori spuriously-indusiate, rotundate, covered by the revolute subherbaceous margin of the pinnules, at length confluent into a transverse line (parallel to the margin) often becoming effuse; the *receptacles* punctiform. *Veins* in the fertile fronds simple or forked, from a central costa; in the more divided sterile fronds simple or forked in the ultimate segments; *venules* free.

Fronds dimorphous, dwarf, herbaceous, bi-tripinnate; the fertile contracted, *i. e.*, with revolute siliculiform pinnules. Rhizome short decumbent.—(*Moore*).

ALLOSORUS STELLERI. (Repr.) Caudex 4-6 inches high very slender filiform slightly scaly, fronds thin-membranaceous pale-green bipinnate, sterile pinnules obovate or subrhomboidal sinuato-lobate, fertile ones lanceolate obtuse crenate all more or less petiolate, terminal ones elongated, veins remote simple or forked, sori subrotund, involucres broad continuous very thin membranaceous whitish subconvex but close pressed, stipes very slender dark-brown glossy, superior rachises winged.—Pellæa gracilis, *Hook Sp. Fil.* ii. 138;—Allosorus gracilis, *Pr. Gray, Man of the Bot. of North U. St. p.* 264. *ed.* 2. *p.* 591. *t.* 9;—Pteris gracilis, *Mich., Fl.* ii. *p.* 262, (*not Fée.*);—Cheilanthes gracilis, *Kaulf. Enum. Fil. p.* 209;—Allosorus Stelleri, *Rupr. Dist. Crypt. Ross* 47.—*Ledeb, Fl. Ross.* iv. 526.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. N. America, Canada, N. India, Kumaon (alt. 10,000 feet), Champwa, N. W. Thibet.

PLATE No. LXXIII.

Allosorus Stelleri
(Rupr.)

POLYPODIEÆ.

POLYPODIUM. (See "Ferns of Southern India," p. 55.)

POLYPODIUM DRYOPTERIS. (L.) Caudex long creeping branched more or less scaly, stipes a span to a foot or more long very slender straminecous scaly below, fronds thin-membranaceous 5-6 inches and more long pentangular-deltoid tripartito-bipinnate, primary divisions long-petioled (especially the terminal one) deltoid, secondary pinnæ mostly sessile 1½-2 inches long oblong or ovato-oblong rather obtuse deeply pinnatifid, sometimes again pinnate at their base, segments oval entire or the inferior ones pinnatifido-serrate, veins forked, sori dorsal on the upper veinlet nearer the margin than the costule.—*Hook. Sp. Fil.* iv. 250.—*Linn. Sp. Pl. p.* 1,555.—*Engl. Bot. t.* 616.—*Sw. Syn. Fil. p.* 42.—*Schk. Fil. t.* 25.—*Willd. Sp. Pl.* v. *p.* 209.—*Hook. et Arn. Br. Fl. ed.* 8. *p.* 580. —*Ledeb. Fl. Alt. α*, genuinum ; *his β is* P. Robertianum).—*Hook. Brit. Ferns* 4 ;—Phegopteris, *Fée.—Metten. Phegopt. p.* 9 ;—Polypod. calcareum, *Ph. N. Am. Fil.* ii. *p.* 639.

Hab. Throughout Europe, N. India, Western Himalaya, Siberia, Japan, Greenland, Northern United States.

PLATE No. LXXIV.

Polypodium Dryopteris
(L)

POLYPODIEÆ.

PLEOPELTIS. (See "Ferns of Southern India," p. 57.)

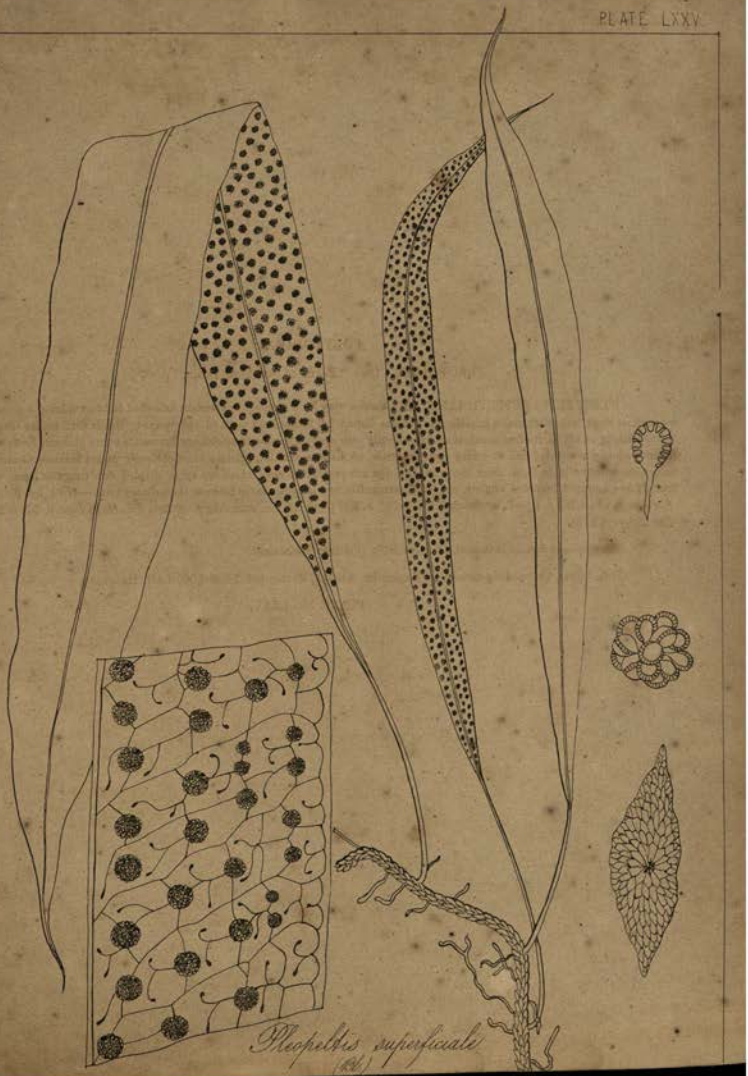
PLEOPELTIS SUPERFICIALIS. (Bl.) Caudex very long creeping or scandent branched tortuose sparingly paleaceous with subscariose short lanceolate scales, stipites more or less distant 2-6 inches long often curved upwards, fronds 6-12 inches long 1-2 inches broad straight or subfalcate firm-membranaceous generally very opaque lanceolate or oblongo-lanceolate entire glabrous finely acuminated, below gradually attenuated and decurrent upon the stipes, no distinct costules, primary veins obliquely patent flexuose slender united by transverse veins so as to form about four rows of large subquadrate areoles, these are again divided into irregular lesser ones which include free simple or branched veinlets, sori small arranged in two irregular series between the primary veins.—*Hook. Sp. Fil.* v. 71.—*Bl. Fil. Jav. p.* 136. *t.* 56. *f.* 1;—P. hymenodes, *Wall. Cat. n.* 283; (*not of Kze. according to Metten. Fil. Hort. Lips. p.* 37. *t.* 25. *f.* 40-41. *Fée. Polyp. p.* 115).

The specimen figured is from the Khasya Hills, (Calcutta Herbarium.)

Hab. Java, Chappadong mountains, Tenasserim, Khasya, Bhotan (alt. 3,000-6,000 feet), Hongkong.

PLATE No. LXXV.

PLATE LXXV



Pleopeltis superficiale
(Bd.)

POLYPODIEÆ.

POLYPODIUM. (See "Ferns of Southern India," p. 55.)

POLYPODIUM SUBFALCATUM. (Bl.) Caudex small, obliquely erect, crinite rather than paleaceous, stipites short, 3-8 lines long, patenti-pilose, fronds firm-membranaceous, hairy on both sides and on the costa, 6-8 inches long, 1-1½ inch broad, oblong-lanceolate subacuminate attenuated below deeply almost to the rachis pinnatifid, segments horizontally patent from a rather broad and decurrent base, linear-lanceolate acute, strongly serrated or pinnatifido-serrate, lower ones remote, distinct smaller than the rest, costule slender flexuose, veins evident, distant oblique soriferous at the apex, sori small globose one to each serrature equi-distant between the costule and the margin. *Hook. Sp. Fil.* iv. 193.—*Bl. Fil. Jav., p.* 186. *t.* 87. *A. B. J. Sm. in Hook. Journ. Bot.* 111. *p.* 394. *Metten. Polyp. p.* 52; —P. fili pendulifolium ;—*Fee. en. Fil. p.* 240,—*6 me. Mèm. p.* 11. *t.* 5 *f.* 3, *var. J. β glabrum* ; fronds glabrous.

The specimen figured is from the Herbarium of the Calcutta Botanical Gardens.

Hab. Nepal, Kumaon (alt. 8,000 feet). Sikkim, Himalaya, Java, Luzon.

PLATE No. LXXVI.

Polypodium subfalcatum
Var β glabrum (R.)

POLYPODIEÆ.

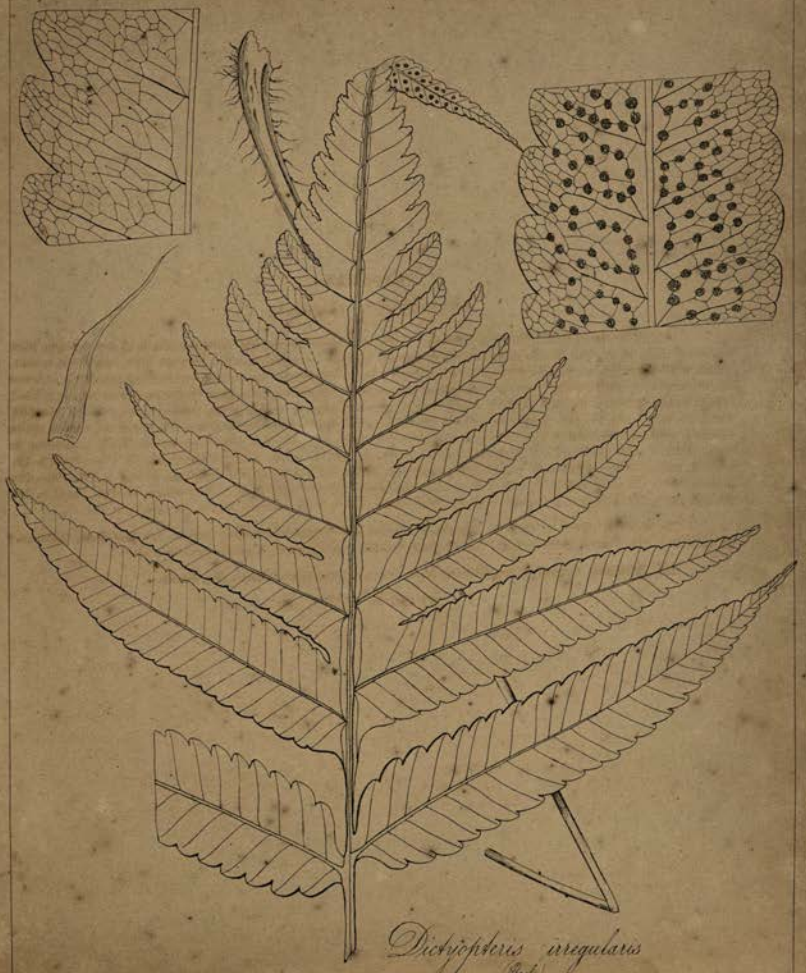
DICTYOPTERIS. (See page 4.)

DICTYOPTERIS IRREGULARIS. (Presl.) Caudex stout ascending, stipites tufted 4 inches to 1½ foot in length, black setaceo-palescenous at the base, fronds subcoriaceo-membranaceous minutely pellucido-punctulate glabrous often subglaucous beneath, pinnate with very numerous pinnæ, from 6 inches to a foot long, 1-3 inches wide more or less, petiolate broad-oblong acuminated, the lowest pair half-ovate unequally bipartite, lowest segments deflexed and sometimes free, and 5-6 inches long, all of them more or less deeply lobed, often to within one-third of the costa, the lobes oblong, acute, or acuminate entire or sinuato-lobate, terminal pinna petiolate pinnatifid, costule one to each lobe, the veins anastomose, copiously forming elongated areoles, which are longest near the costæ and costules, areoles frequently including a free veinlet; sori dorsal or compital or even terminal on the free veins, copious, but rarely approaching the costa. *Hook. Sp. Fil.* v. 101. *Pr. Reliq. Haenk.* i. *p.* 25. *t.* 4. *f.* 3. *Bl. Fil. Jav. p.* 164. *t.* 72;—Dictyopteris, *Pr. Tent. Pterid p.* 194. *t.* 8. *f.* 7. *Moore*;—Polyp. difforme, *Bl. Fil. Jav.* 135;—Aspidium. *Bl. En. Fil. Jav. p.* 160;—Dictyopteris, *Moore Ind. Fil. p.* 90;—Phegopteris, *Metten. Fil. Hort. Lips. p.* 84. *t.* 85. *f.* 29;—Pheg. macrodonta, *Metten. Phegopt, p.* 31;—Dictyopteris, *Pr. Tent. Pterid. p.* 194. *Fée Gen. Fil. p.* 267. *t.* 31. *A. f.* 2;—Polyp. confluens. *Wall. Cat. n.* 325;—Polyp. eximium, *Kze. in Bot. Zeit* iv. *p.* 424.

The specimen figured is from the Calcutta Herbarium and represents the upper portion of a large frond. Aspidium ? Pl. CXVIII of "the Ferns of Southern India" is undoubtedly this plant, and the name on the plate should be altered.

Hab. Moulmein, Anamally forests (Madras), Malay islands, Borneo, Luzon, Malacca, Fiji Islands.

PLATE No. LXXVII.



Dictyopteris irregularis
(Kütz.)

POLYPODIEÆ.

GONIOPHLEBIUM. (See page 5.)

GONIOPHLEBIUM. SUBAURICULATUM. (Bl.) Caudex creeping, stoloniferous densely clothed with narrow acuminato-setaceous scales subpruinate, stipites a span to a foot and more long, sparingly paleaceous, rufous-brown, fronds firm, subcoriaceo-membranaceous glabrous 2-6 feet long a foot and more wide pinnated, pinnæ horizontal, numerous yet remote; 3-4 to 8-10 inches long, ¼ to nearly ½ an inch wide; shortly petioled and jointed on the rachis from a somewhat cordate or truncated and occasionally auricled, base linear-lanceolate finely and gradually acuminated serrated, veins forming a double costular series of areoles, including a free venule, of which the lower series is soriferous, marginal veinlets free, sori in a single series nearer the costa than the margin forming, slightly elevated, pustules on the superior side. *Hook. Sp. Fil.* v. 32. *Bl. Fil. Jav. p.* 177. *t.* 83. *Metten. Fil. Hort. Lips. p.* 33;—P. Reinwardtii, *Kze. (fide Metten.)* Goniophlebium, *De Vriese*;—G. Pleopeltis, *Fée*—var. *β. Serratifolia*; pinnæ very coarsely serrated;—Goniophlebium serratifolium, *Brack. Fil. U. S. Expl. Exped. p.* 35;—Polyp. pallens, *Bl. Fil. Jav. t.* 84;—*f.* 1. *J. Sm. Metten. Polypod. p.* 81.

The specimen figured is from the Calcutta Herbarium (from Java.)

Hab. Khasya, Luzon, Java, Sumatra.—*Var β.* Fiji Islands, Luzon, Java.

PLATE No. LXXVIII.

PLATE LXXVIII.

Goniophlebium subauriculatum (Bl.)

POLYPODIEÆ.

GONIOPHLEBIUM.

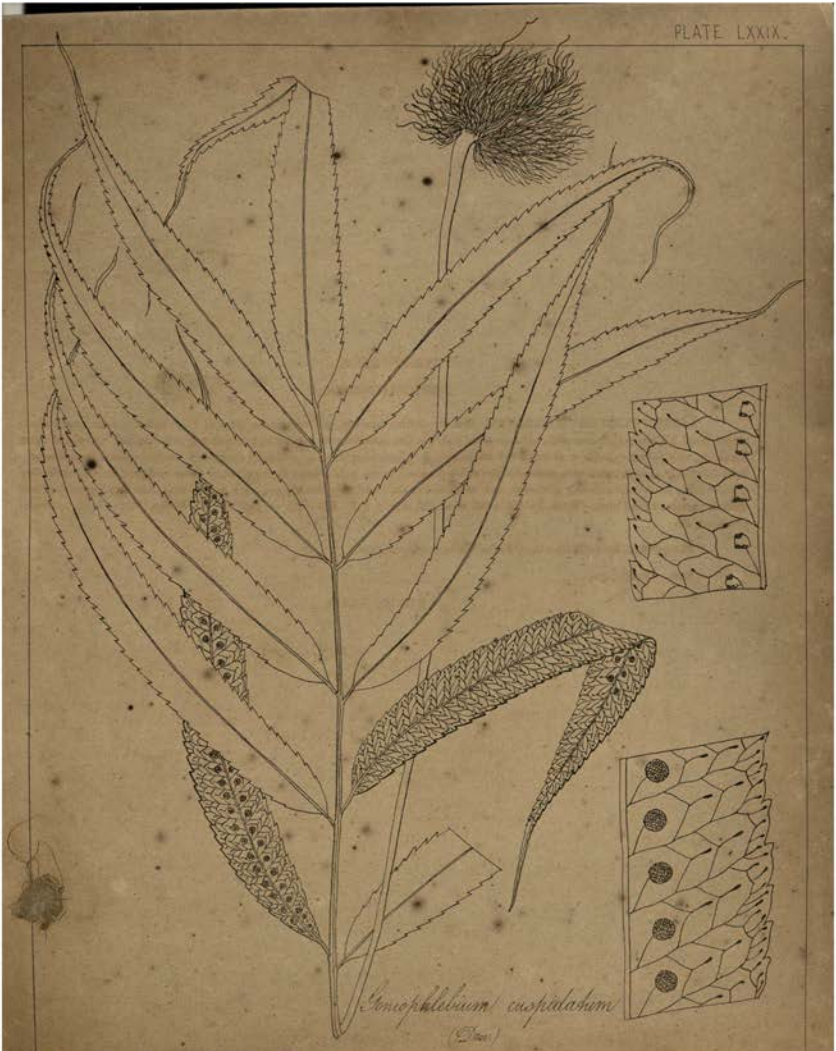
GONIOPHLEBIUM CUSPIDATUM. (Don. l) "Caudex creeping, paleaceo-crinite," stipites 8-10 inches or more long, fuscous glossy, frond 2-3 feet long, 1 foot wide, oblongo-ovate, glabrous firm-membranaceous pinnate, pinnæ shortly petiolate and articulated upon the rachis, very patent opposite or alternate 6-8 inches long, $\frac{1}{2}$ $\frac{3}{4}$ inch wide from a gradually attenuated narrow-cuneate base, elongato-lanceolate finely and long-acuminate serrated entire at the base and at the point, veins forming two or three series of areoles, including a free veinlet, the costal series only soriferous, sori much nearer the costa than the margin, more or less sunk and forming more or less distinct pustules on the back. *Hook. Sp. Fil.* v. 32. *Don. Fil, Nep. p.* 6. ? *Bl. Fil. Jav. p.* 175. *f.* 82. *Metten. Polyp. p.* 81 ;—Goniophlebium, *Pr.*

The specimen figured is from the Calcutta Herbarium (from Java.)

Hab. Nepal, Java.

PLATE No. LXXIX.

PLATE LXXIX.



Goniophlebium cuspidatum

(Dtm.)

POLYPODIEÆ.

* * *Veins reticulated with free included veinlets.*

Free veinlets divaricate.

DIPTERIS, Reinwardt. Regensb. Bot. Zeit. 11-3.

(Polypodii. Sp. *Auct.*; Drynariæ, Sp., *J. Sm.*)

Sori non-indusiate, small, round, superficial; the *receptacles* punctiform. (1) Transversely sub-serial between the branches of a dichotomous costa, when the segments are confluent; or (2) longitudinally uniserial on each side, a central costa in the ultimate segments, when more distinct. Venation diverse: (1) in the more confluent species, the costa dichotomo-flabelliform with the *veins* prominent, transversely anastomosing, the *venules* and *veinlets* (several series) thickly anastomosing, the ultimate or penultimate soriferous, the ultimate branches often free dilated at the apex; or (2) in the more distinctly divided species, *costa* central, the *veins* and *venules* irregularly anastomosing with divaricate free sterile *veinlets*.

Fronds bipinate, digitato-palmately-lobed, or repitito-dichotomously partite, elongately stipitate, coriaceous. Rhizome woody creeping, the fronds adherent, or not readily separable. So remarkable and peculiar in habit, that, relying partly on the oligocarpous sori, we have kept it distinct from our *Pleopeltis* with which, in company with *Drynaria*, it is technically allied. (*Moore.*)

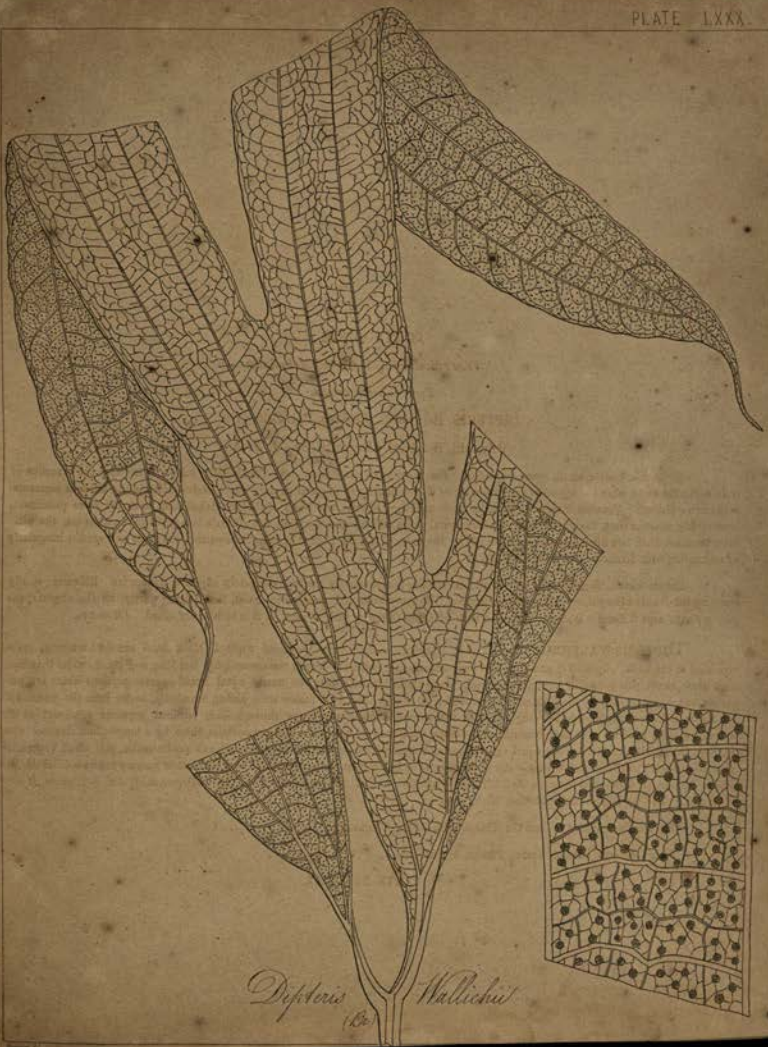
DIPTERIS WALLICHII. (Bc.) Caudex creeping, clothed with appressed copious black hard subulato-setaceous scales wrinkled at the back, stipites 1-2 and more feet long smooth and polished, fronds coriaceous 1-2½ feet long and much wider than long dark-green above, pale-yellowish ferruginous beneath, flabelliform bipartite into two nearly equal broad-cuneate portions which are palmately and dichotomously divided, ultimate segments 6-8-10 inches long, 1½-2 inches wide oblong acuminate, costæ from the summit of the stipes dichotomously branched through the disk of the frond, a single pair runs through each terminal segment connivent at the apices, venation manifest prominent beneath, all the costæ are united by transverse flexuose costules, these by a longitudinal flexuose vein through the middle into two nearly equal series of costular areoles, then again into lesser ones all sub-quadrangular, sori small, superficial copious scattered in the areoles, but generally in series more or less perfect and accompanied by a resinous or gummy substance. *Hook. Sp. Fil. v. 99. Br. in Hook. and Grev. Ic. Fil. t.* 168-9. *Wall. Cat. n.* 287. *Metten. Polypod. p.* 119; —Drynaria, *J. Sm.*; —Dipteris. *Moore Ind. Fil. p.* 341; —Polyp: macrocherios, *Wall. Herb.*

The specimen figured is from the Khasya Hills—(Dr. Thomson.)

Hab. Khasya, Bhotan, Assam, Pundoa Mountains.

PLATE No. LXXX.

PLATE LXXX.



Dipteris Wallichii
(Br.)

POLYPODIEÆ.

NIPHOBOLUS. (See "Ferns of Southern India," p. 61.)

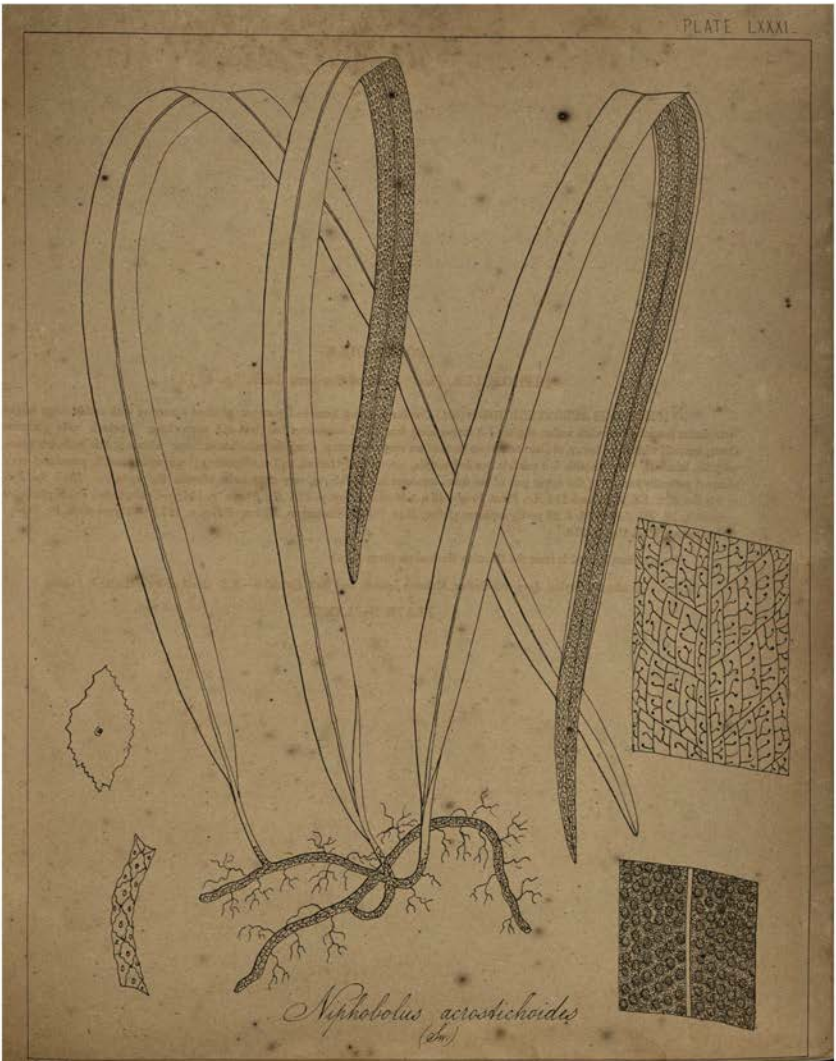
NIPHOBOLUS ACROSTICHOIDES. (Sw.) Caudex creeping, branched younger portions squarrose with rather large bright ferruginous lanceolato-subulate scales, stipites 1-3 inches long, frond hard-coriaceous 1-3 feet and more long, ½-1 inch wide glabrous above, beneath whitish or tawny, stellato-tomentose (tomentum very deciduous) elongato-lanceolate or linear obtuse; *Sterile* fronds generally the broadest, "areoles with 3-6 veinlets free and simple, or variously forked, and anastomosing;" sori rather small, prominent very compact generally occupying the upper part of the frond arranged in 6-8 oblique, very close series between the costules. *Hook. Sp. Fil.* v. 44. *Sw. Syn. Fil. p.* 29. and 225. *An. Forst. Prodr.* 434. *Metten. Polyp. p.* 128. *Br. Prodr. p.* 146;—Cyclophorus, *Pr.* Niphobolus puberulus, *Bl. Fil. Jav. p.* 56. *t.* 23;—Cyclophorus glaber, *Desv.* (*not* P. Samarense, *Metten. Polyp. p.* 123.);—Gyrosorium, *Pr.* Polypfurfuraceum; *Wall. Cat. n.* 278.

The specimen figured is from the Calcutta Herbarium (from Java.)

Hab. Moulmein, Ceylon, Java, Isle Samar, Molucca Islands, and New Hebrides—N.E. Coast of New Holland, Penang.

PLATE No. LXXXI.

PLATE LXXXI.



Nyphobolus acrostichoides
(Sw.)

DICKSONIEÆ.

B. *Indusium distinctly two-valved.*

DICKSONIA. L' Heritier Sertum Anglicum, 30.

(Balantium, *Kaulfuss. Presl.*;—Culcita, *Presl.*; Leptopleuria, *Presl.*; Cystodium, *J. Smith*; Davalliæ Sp., *Auct.*; Cibotii Sp., *Auct.*; Microlepiæ Sp., *Auct.*; Pataniæ Sp., *Auct.*; Nephrolepidis Sp., *Mettenius.*)

Sori involucrately-indusiate, globose or short transverse oblong, marginal, more or less reflexed; the *receptacles* globose or transverse oblong, terminal. *Indusium* coriaceous, double, *i. e.* two-valved; the outer or accessory valve formed of a more or less attenuated lobule of the frond, cucullate, sometimes equalling in size, but more frequently larger than the inner valve or proper indusium, which latter, when smaller, is less convex than the outer. *Veins* simple forked or pinnate, from a central costa, *venules* free.

Fronds coriaceous, usually large decompound, sometimes pinnate, the fertile portions appearing somewhat contracted. Rhizome thick, short, erect or arborescent; sometimes decumbent, criniferous. Agenus of noble ferns, including several arborescent species. It is distinguished from *Dennstœdtia* by the two-valved, not entire cup-shaped, indusium; and from *Cibotium* by the more or less herbaceous texture of the outer valve of the Indusium, which in *Dicksonia*, is but a partially changed lobule of the frond. (Moore.)

DICKSONIA APPENDICULATA. (Wall.) Every where especially beneath piloso-glandular, fronds lanceolate tall, much attenuated at the base bipinnate, pinnæ narrow, oblong almost linear pinnatifid, the segments oblong entire or bi-trifid, the base decurrent on the rachis, sori large, globose copious upon the shortened teeth of the segments. *Hook. Sp. Fil. 4.* 79. *Wall. Cat.* n. 65.

The figure is taken from Sir W. Hooker's Sp. Fil.

Hab. Nepal, Kumaon.

PLATE No. LXXXII.

Dicksonia appendiculata
(Wall.)

DICKSONIEÆ.

* * *Indusium distinctly two-valved.*

CIBOTIUM. Kaulfuss, Berl. Jahrb. der Ph. (1820) Id. Enum. Fil. 229. *t.* 1.

(Pinonia, *Gaudichaud* ;—Hiatea, *Menzies M. S.*, (Hook. Sp. Fil.)—Dicksonia, Sp. *Auct.* ;—Balantii, Sp. *Auct.* ;—Aspidii, Sp. *Auct.* ;—Polypodii, Sp. *Auct.*)

Sori involucrately-indusiate, sub-globose, marginal, reflexed ; the *receptacles* slightly elevated, terminal. *Indusium* two-valved, coriaceous, distinct from the substance of the frond ; the outer valve larger cucullate, the inner operculiform. *Veins* forked or pinnate from a central costa ; *venules* free.

Fronds large, decompound ; Rhizome thick, short decumbent, or erect. This genus, like Dicksonia, has two-valved indusia ; the texture of the two valves is alike and evidently different from that of the frond, on the extreme margin of which they are borne. (Moore.)

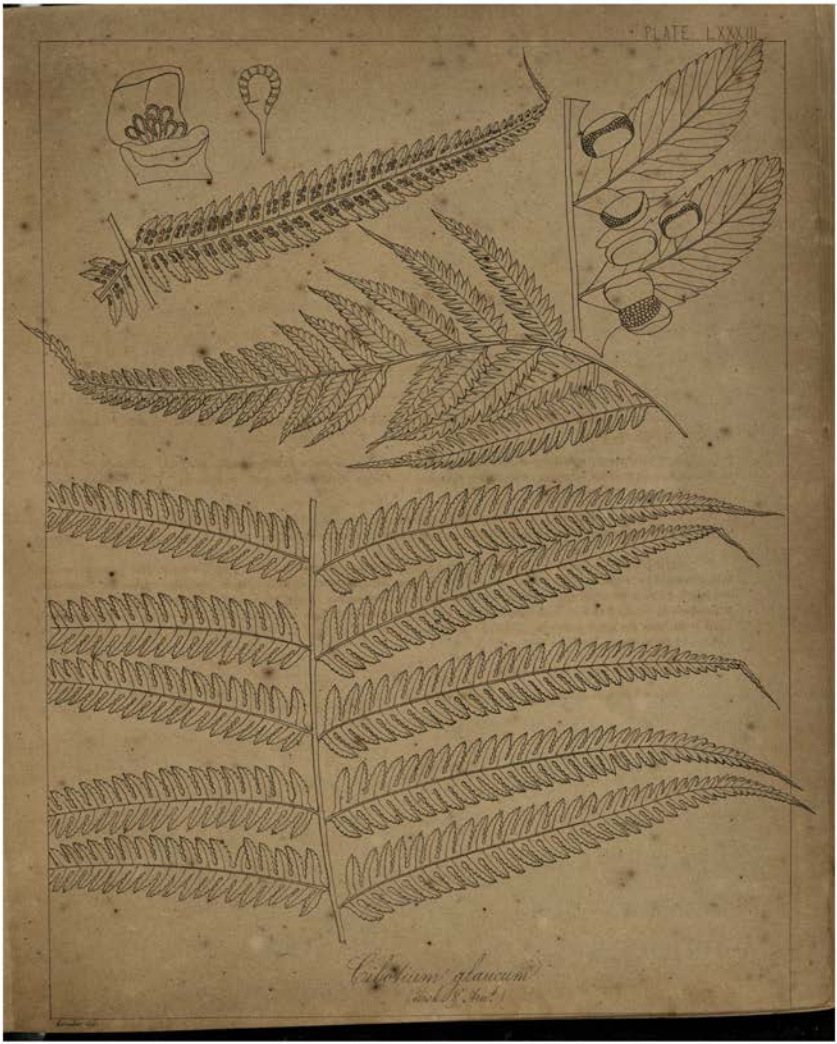
CIBOTIUM GLAUCUM. (Hook. and Arnt.) Fronds bipinnate, glabrous and shining on the upper side, glaucous beneath, with occasionally a few hairs on the rachis, pinnules deeply pinnatifid, lanceolate, acuminate 4-5 in. long, the upper ones diminishing and tapering into a pinnatifid apex, lobes or segments numerous, more or less falcate, veins simple or forked, indusia very prominent and coriaceous, usually 2 to 4 on each margin of each lobe or sometimes only 1 on each side at the base, valves concave, very nearly equal or the inner one rather narrower. *Benth. Fl. Hongkong, p.* 460. *Hook. Sp. Fil.* i. 82 ;—C. glaucescens *Kunze. Hook. Sp. Fil.* i. 82 ;—C. Assamicum. *Hook. l. c.* i. 83. *t.* 29. *β.*

The specimen figured is from Assam.

Hab. Assam, Hongkong, S. China, Sandwich Islands.

PLATE No. LXXXIII.

PLATE LXXXIII.



Cibotium glaucum

ALSOPHILEÆ.

ALSOPHILA. (See "Ferns of Southern India," p. 19.)

ALSOPHILA COMOSA. (Wall.) Unarmed, stipes densely clothed with long chaffy pale brown deciduous scales, rachis strigose or almost setose above, fronds bipinnate, pinnæ united towards the apex, so as to be there pinnatifid, pinnules sessile or nearly so oblong-lanceolate moderately acuminated submembranaceous pinnatifid about two-thirds of the way down, segments ovate slightly falcate obtuse, veins generally forked, bullate scales none, receptacles small slightly elevated. *Hook. Sp. Fil.* i. 53 ;—A. Comosa, *Wall. Cat.* n. 319.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Khasya Hills, Sincapore, Java.

PLATE No. LXXXIV.

Alsophila comosa
(Wall.)

ALSOPHILA.

ALSOPHILA CONTAMINANS. (Wall.) Aculeolate, frond bipinnate coriaceous glaucous beneath, pinnules oblong-lanceolate acuminate deeply pinnatifid, segments oblong falcate, the fertile ones narrower, rather obtuse crenulate, sori upon forked veins in lines parallel with the costa and covering nearly the whole segment, capsules mixed with hairs. *Hook. Sp. Fil.* i. 52 ;—A. Contaminans, *Wall. Cat. in Index* ;—Polypodium contaminans, *Wall. in Herb.* 1823. *Cat. n.* 320 ;—Chnoophora glauca, *Blume. En. Fil. Jav. p.* 243 ;—Alsophila glauca, *J. Sm.*

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Sylhet, Penang, Java, Molucca, Luzon, South Camarines, Phillipines, New Guinea, Birmah.

PLATE No. LXXXV.

Alsophila contaminans
(Wall.)

ALSOPHILA.

ALSOPHILA BRUNONIANA. (Wall.) Unarmed, fronds bipinnate pinnules lanceolate acuminate deeply pinnatifid coriaceous glaucous beneath, veins once or twice forked, bullate scales none, margin re-curved entire or crenulate, sori in two rows occupying the greater part of the segments. *Hook. Sp. Fil.* i. 52. *Wall. Cat.* n. 7073.

The specimen figured is from the Khasya Hills—(Dr. Thomson.)

Habs. Khasya Hills, Sylhet, Mishmee, Naga Hills, Cachar.

PLATE No. LXXXVI.

PLATE LXXXVI.

Alsophila Brunoniana (Wall.)

CYATHEA. (See "Ferns of Southern India," p. 19.)

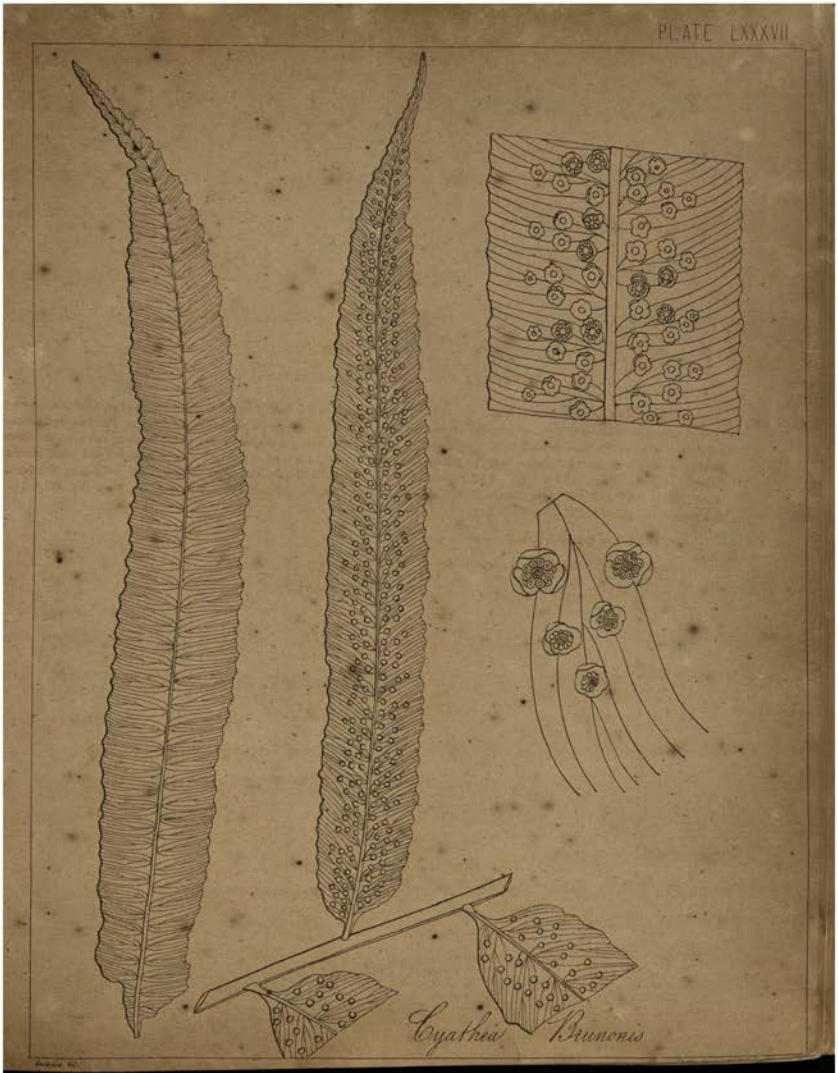
CYATHEA BRUNONIS. (Wall.) Stipes 1 to 2 feet long, fronds 2-3 feet, pinnated-pinnæ 6-8 inches long alternate, between membranous and coriaceous, oblongo-lanceolate acuminated with a long narrow point, obliquely truncated at the base and shortly petiolate, sinuato-crenate often serrated at the margin above. Sori copious from the middle of the forked veins or veinlets. Involucre globose or slightly depressed, bursting very irregularly at the top so as to become cup-shaped with a lacerated and lobed margin. Capsules stalked. *Hook. Sp. Fil.* i. 15. *Wall. Cat. n.* 179;—C. Loingifolia ctensiformis. *Wall. in Herb.* 1823;—Cyathea Moluccana, *R. Br. Desv. Prod.* 322;—Cyathea pinnata, *Roxb. Cat. Journ. Nat. Hist.* iv. 517;—Schizocana Brunonis;—*Hook. Gen. Fil. t.* 2;—Schizocana Gaudichandii. *Pée. Gen. Fil.* 354.

The specimen figured is from Penang.

Hab. Penang, Malacca, Molucca Islands, Borneo.

PLATE No. LXXXVII.

PLATE LXXXVII



Cyathea Brunonis

WOOWARDIEÆ.

WOODWARDIA. (Sm. Mem. Acad, Turin. v. 411. *t.* 9.)

(Lorinseria, *Presl.* ;—Anchistea, *Presl.* ;—Blechni, Sp. *Auct.*)

Sori in a single series, oblong or oblong-linear sunk in a cavity of the frond, parallel with and near the costa or costules. *Receptacles* on the transverse anastomosing veins which form a series of arches next the costa and from which veins originate and are more or less anastomosing sometimes very much so even to the margin. Involucres almost coriaceous usually persistent and opening with a lid above the cavity.

Caudex or rhizome very long and thick decumbent scaly copiously rooting. Stipites very paleaceous at the base with long subulate scales. Fronds pinnated or bipinnate. (Hooker.)

WOODWARDIA RADICANS. (Smith). Stipes elongate with large lanceolate acuminate paleaceous scales at the base, fronds ample pinnate subcoriaceous, pinnæ distant often a foot or more long petiolate deeply pinnatifid broad-lanceolate acuminate, lacinie ovato-lanceolate acuminate subfalcate spinuloso-serrate towards the apex, veins reticulate towards the main costa (of the pinnæ), a single series of areoles outside of the sori thence free to the margin, sori parallel with and near to the costule short oblong sunk in the cavity of the sorus which has an elevated margin, involucre vaulted coriaceous, rachis here and there producing large scaly germinating gemmæ at the base of some of the pinnæ. *Hook. Sp. Fil.* iii. 66. *Smith, Act., Taur.* v. *p.* 412—*Schk. Fil. p.* 104. *t.* 112—(*venation very bad*), *Sw. Syn. Fil. p.* 117. *Hook. Gen. Fil. t.* 17 ;—Blechnum radicans, *Linn. Mant. p.* 307 ;—Woodwardia stans, *Sw. Syn. Fil. p.* 117. *Schk. p.* 104. *t.* 113 ;—W. auriculata, *Bl. En. Fil. Jav. p.* 196.

The specimen figured is from Dalhousie—(Col. Dyas.)

Hab. Himalaya mountains, (alt. 1-5,000 feet), Java, Madeira, Canary Islands, Spain, Portugal, Italy Sicily.

PLATE No. LXXXVIII.

Woodwardia radicans
(Sm.)

PTERIDEÆ.

PTERIS. (See "Ferns of Southern India," p. 11.)

PTERIS HETEROMORPHA. (Fee.) 1½-2 feet high erect firm, caudex scarcely any, roots wiry, cæspitose, frond 1-1½ foot high broad lanceolate subcoriaceo-membranaceous remotely pinnate, pinnæ usually opposite, 4-6 pairs sessile linear-lanceolate elongated acuminated, 3 to 5 or 6 inches long entire at the margin or subsinuato-crenate serrated only at the apex simple (undivided) or here and there with only a single or two horizontal lobes or ears near the base (rarely above the base), at other times the upper pinnæ are sparsely lobed and the lower ones gradually more so, the lowest ones pinnatifid in their lower half with 4-6 oblong-lanceolate lobes on each side spreading horizontally (almost pectinated,) veins approximate simple or once forked, veinlets reaching to the margin, sori continuous but not extending to the apex, involucres marginal membraneous narrow, stipites short in proportion to the length of the fronds and rachises slightly rough to the touch bright tawny glossy. *Hook. Sp. Fil.* ii. 166 ;—Pt. heteromorpha, *Fée, Gen. Fil. p.* 125-127 ;—Pt. propinqua, *J. Sm. En. Fil. Philipp. in Hook. Journ. of Bot.* iii. *p.* 405—*(not of Agardh and name only.)*

The specimen figured is from Birmah.

Hab. Birmah, Luzon.

PLATE LXXXIX.

Pteris heteromorpha
(Fee)

PLATYLOMEÆ.

PLAGIOGYRIA. (See page 51.)

PLAGIOGYRIA GLAUCA. (*Bl.*) Caudex ? stipites elongated, subcompressed tetragonous with two furrows in front, the base dilated triquetrous on the anterior face bearing spongy depressed glands, fronds ovato-oblong 1-2 feet long pinnated, *sterile* pinnæ numerous, 3-5 inches long, chartaceous horizontally spreading sessile or very nearly so lanceolate, acuminated at the base, truncated beneath having a gland as much attached to the rachis as to the very short petiole, the margins finely dentato-serrulate, rather more strongly at the apex, white and almost powdery beneath, green above with a tinge of red, veins copious, compact simple and forked, ultimate short pinnæ confluent into a pinnatifid and lobed caudate apex, *fertile* pinnæ narrow-linear obtuse erecto-patent on very short petioles which sometimes bear a gland beneath, sori and involucres as in other *Plagiogyriæ*. Lomaria *(Plagiogyria) glauca. Hook. Sp. Fil.* iii. 22. *Bl. En. Fil. p.* 204. *Kze. in Bot. Zeit.* viii. *p.* 143; *in Schkh. Fil. Suppl.* ii. 24. *t.* 138.—Plagiogyria glauca, *Metten. Plagiog. p.* 9.

The specimen figured is from the Khasya Hills—(Calcutta Herbarium).

Hab. Khasya Hills, Java.

PLATE No. XC.

Plagiogyria glauca (Blume)

CYSTOPTERIDEÆ.

CYSTOPTERIS. Bernhardi. Schrad. Neues. Journ. Bot. i., Part 11., 5. 26. *t.* 2. *f.* 9.

(Cystea, *Smith* ;—Cyclopteris, *Gray* ;—Aspidii, Sp., *Auct.* ;—Polypodii Sp., *Auct.* ;—Cyathea Sp., *Auct.* ;—Nephrodii Sp., *Auct.* Athyrii Sp., *Auct.*)

Sori indusiate ; the *receptacles* medial. *Indusium* roundish-ovate, fornicate or sub-hemispherical, affixed by its broad base, the apex often lacerate, sometimes acuminate. *Veins*, simple forked or pinnate from a central costa ; *venules* free.

Fronds membranaceo herbaceous, bi-tri-pinnate. Rhizome tufted, decumbent, or elongated and creeping. (Moore.)

CYSTOPTERIS FRAGILIS. (Bernh.) Fronds broad lanceolate bipinnate, pinnæ ovate or lanceolate variously toothed or acuminated or pinnatifid, the segments more or less acute entire or again toothed. Sori scattered more or less distant, sometimes crowded and almost confluent, rachis winged. *Hook. Sp. Fil.* i. 197. *Bernh. New Journ. Bot.* i. *p.* 27 ;—Polypodium, *L.* ;—Aspidium, *Willd. Sp., Pl.* v. *p.* 280 ;—Cyathea Orientalis, *Desv.*

The specimen figured is from Nepal.

Hab. Himalayas, Simla, Nepal, Punjab, Great Britain, and throughout Europe, Siberia, Asia Minor, Persia, North and South America, Madeira, West Indies, North and South Africa.

PLATE No. XCI.

Cystopteris fragilis
(Linn.)

ACROPHORUS. (See " Ferns of Southern India," p. 3.)

ACROPHORUS PSEUDO-CYSTOPTERIS. (Kze.) Caudex creeping covered with peltate imbricated jagged scales, fronds ovate membranaceous supra decompound, primary pinnæ petiolate ovate lanceolate, secondary petiolate ovate oblong, pinnules deeply pinnatifid, the segments, very narrow linear acuminate, entire or bifid sori medial on the segments, indusium small sub-reniform, veins terminating within the margin.

This species somewhat resembles *A. affinis*, but the pinnules are more finely cut and the caudex is quite different.

The specimen figured is from Dalhousie—(Colonel Dyas).

Hab. Himalayas.

PLATE No. XCII.

Acrophorus pseudo-cystopteris
(Kze)

ACROPHORUS.

ACROPHORUS NODOSUS. (Presl.) Frond tripinnate, membranaceous furfuraceous on both sides of the veins, pinnules sessile (chaffy beneath at their insertions) oblong-lanceolate, secondary ones sessile oblong obtuse, pinnatifid, segments cuneiform obtuse, lowest ones incise-serrate or at the base again sub-auriculate, sori solitary sub-marginal, rachis nodose above at the insertion of the pinnæ and ferrugineo-tomentose, stipes slightly rough or glabrous paleaceous below. *Hook. Sp. Fil.* i. 157 ;—Aspidium nodosum, *Bl. En. Fil. Jav.* p. 171. ;—Acrophorus nodosus, *Pr.* Aspidium ? foliolosum, *Wall. Cat.* 359 ;—Davallia stipellata, *Wall. Cat.* 260 ? Monochosorum, davallioides, *Kze. Bot. Zeit.* vi. 119—? Anogramma davallioides, *Fee. Gen. Fil.* 184.

The specimen figured is from the Khasya Hills—(Dr. Thomson).

Hab. Khasya, Assam, Sikkim, Bhotan, Java, Moluccas.

PLATE No. XCIII.

Acrophorus nodosus
(Pisl.)

ACROPHORUS.

ACROPHORUS ASSAMICUS. (Bedd.) Caudex creeping covered with numerous imbricated chaffy golden scales, fronds glabrous shining, 8-14 inches long, (including the stipes which is 2 to 3 inches) 2 to 3 inches broad, coriaceous membranaceous lanceolate pinnate with the primary pinnæ alternate or opposite pinnatifid almost to the rachis, lower ones petiolate upper ones decurrent so as to form a regular wing to the rachis, pinnules pinnatifid, segments toothed, each bearing one sorus, veins terminating within the margin involucres as in the genus.

The specimens figured are from Assam—(Dr. Thomson) and are marked by Mr. Moore—"*New species near membranulosus.*"

Hab. Assam.

PLATE No. XCIV.

Acrophorus Assamicus
(Kuhl.)

ACROPHORUS.

ACROPHORUS HOOKERI. (Moore). Fronds ovate or oblongo-ovate glabrous membranaceous 6-10 inches long by 4-5 inches broad tripinnate secondary and tertiary rachides much flattened, being composed, as it were, of the decurrent base of the pinnæ or pinnules, pinnules linear obtuse entire or bifid, veins simple or forked and terminating considerably within the margin, sori, one to each pinnule situated at the forking of the vein, indusium as in the genus.

A delicate finely cut species with much the appearance of Asplen : tenuifolium easier understood from the figure than by any description.

The specimen figured is from the Khasya Hills, (Dr. Thomson).

Hab. Khasya, Sermur, Sikkim.

PLATE No. XCV.

Acrophorus Hookeri
(Moore)

ACROPHORUS.

ACROPHORUS HYMENOPHYLLUS. (Parish). Caudex creeping, furnished with numerous long wiry roots—fronds subglabrous membranaceous very flaccid and transparent ovate or deltoid-ovate pinnate, lower pinnæ deeply pinnatifid with the lower basal segments much the largest, and again pinnatifid with the segments entire or crenated, the remaining pinnæ pinnatifid with the segments crenated. Sori at the apex of the superior veinlets of each segment, indusium as in the genus veins terminating within the margin.

This very delicate species was discovered near Moulmein, by the Rev. Parish, to whom I am indebted for the specimen figured.

Hab. Moulmein.

PLATE No. XCVI.

Acrophorus hymenophyllus
(Brack.)

ACROPHORUS.

ACROPHORUS PARVULUS. (Wall.) Caudex long, creeping, clothed with lax subulate scales, frond very small deltoid tripinnatifid glabrous rigid (from the stout costa), segments linear throughout, slightly grooved above when dry, unequally forked and acute at the apices, sori at the sinus of the forks, involucres suborbicular, dilated above and broader than the segments. *Hook. Sp. Fil.* i. 160. *Wall. Cat. n.* 247. *Hook. Et. Grev. Ic. Fil. f.* 138;—Leucostegia, *J. Sm.*

The specimen figured is from the Calcutta Herbarium, but unfortunately not in fructification.

Hab. Singapore, Borneo, Java,

PLATE No. XCVII.

Actiophorus parvulus
(Wall.)

ACROPHORUS.

ACROPHORUS MEMBRANULOSUS. (Wall.) Caudex hispid, with very long slender subulate rigid membranaceous scales, fronds small, very thin and membranaceous ovato-lanceolate and as well as the slender stipes and rachis pubescenti-hirsute bipinnate pinnæ alternate lanceolate, their rachis winged, pinnules lanceolate pinnatifid, the segments ovato-lanceolate subfalcate, very acute entire or rarely toothed, involucres small, ovato-subrotund acute, very thin and membranaceous fixed by the broad base, the rest free. *Hook. Sp. Fil.* i. 159. *Wall. Cat. n.* 255.

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Nepal.

PLATE No. XCVIII.

Acrophorus membranulosus
(Wall.)

HUMATA. (See "Ferns of Southern India," p. 4.)

HUMATA PARALLELA. (Wall.) Caudex creeping, paleaceous, fronds stipitate coriaceous ovato-lanceolate acuminate deeply pinnatifid nearly to the rachis, segments close parallel, horizontally patent linear or linear-oblong subfalcate entire, the lowermost pair sometimes with a solitary obtuse lobe at the base beneath, rarely more, involucres semiorbicular copious marginal, but all pointing towards the apex of the segments in two close parallel lines (not pointing towards the margins), veins thickened sunk. *Hook. Sp. Fil.* i. 153. *Wall. Cat. n.* 251 ;—Nephrodium Gaimardianum. *Gaud. in Freyc. Voy. Bot. t.* 12. *f.* 1.

The specimen figured is from Birmah—(Parish).

Hab. Singapore, Birmah, Moluccas, Sandwich Islands, Luzon.

PLATE No. XCIX.

Humata parallela
(Wall.)

HUMATA.

HUMATA HETEROPHYLLA. (Sm.) Caudex long, creeping, scaly and hispid with the long reflexed points of the scales, fronds coriaceous, stipitate arising from a scaly bulb, sterile ones oblong or ovato-lanceolate acuminate entire often waved, fertiles ones linear-lanceolate, acuminate deeply sinuato-pinnatifid, the lobes horizontal crenate, involucres reniform copious on the crenatures of the lobes. *Hook. Sp. Fil.* i. 152. *Sm. Act. Taur.* v. *p.* 415. *Willd. Sp. Pl.* v. *p.* 565. *Sw. Syn. Fil. p.* 130 *and* 387. *Hook. et. Grev. Ic. Fil. p.* 230 ;—Humata ophioglossa, "*Cav. Præl.* 1801. *n.* 678 ;"—Davallia pinnatifida, *Sw. Syn. Fil. p.* 130. *Willd. Sp. Pl.* v. *p.* 465 ;—Humata pinnatifida, "*Cav. Præl.* 1801. *n.* 679 ;"—Davallia lobulosa, *Wall. Cat.* n. 241.

The specimen figured is from Singapore.

Hab. Singapore, Penang, Malay Islands, Java, Isle Samar.

PLATE No. C.

Humata heterophylla
(Sw.)

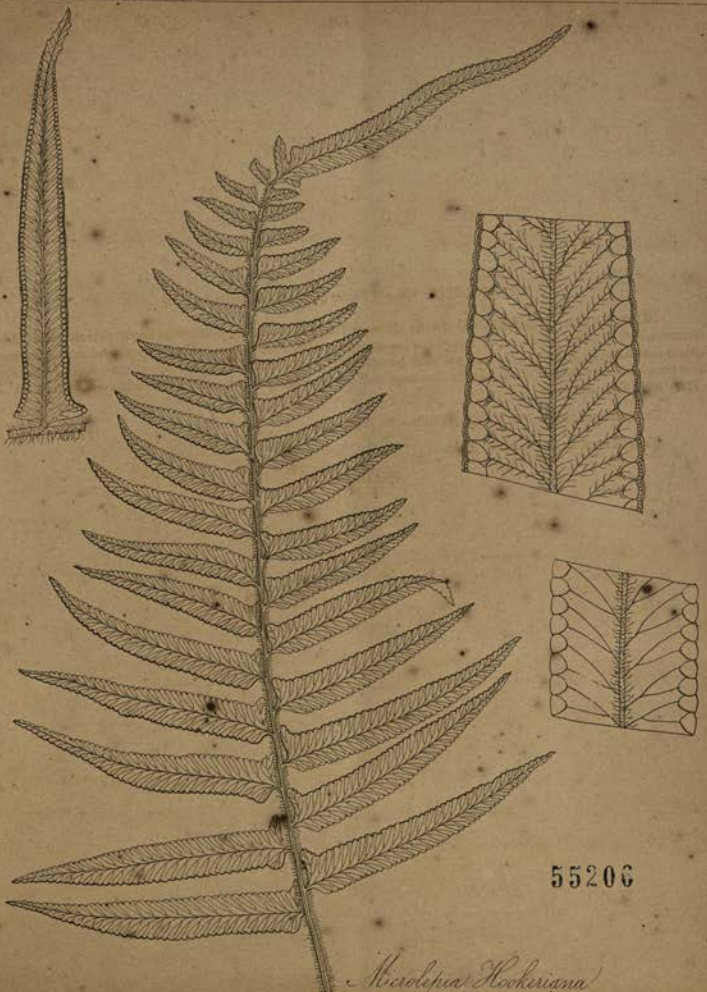
MICROLEPIA. (See "Ferns of Southern India," p. 5.)

MICROLEPIA HOOKERIANA. (Wall.) Stipes a foot and more long, pubescent at length glabrous rachis hirsuto-pubescent, fronds lanceolate pinnate, pinnæ subpetiolate lanceolate from a broad hastate base, gradually acuminated submembranaceous, duplicato-crenated sparingly hairy on the costa and veins beneath, veins parallel dichotomous, sori approximate, forming a continued line at the base of the crenatures of the margin, involucres half-cup-shaped, stipes and rachis pubescenti-hirsute. *Hook. Sp. Fil.* i. 172. *Wall. Cat. n.* 2684.

The specimen figured is from the Khasya Hills—(Dr. Thomson.)

Hab. Khasya, Symet, Kumaon, Assam.

PLATE No. CI.


55206
Microlepia Hookeriana
(Wall.)

MICROLEPIA.

MICROLEPIA SCABRA. (Don.) Fronds broadly ovato-lanceolate firm membranaceous, pinnæ elongate lanceolate subfalcate acuminate pinnatifido-lobate, the acuminated apices serrated, pubescenti-villous beneath, most so on the costa and prominent veins unequally cuneate at the base and subpetiolate, lobes acute crenato-dentate, veins pinnated, sori solitary in the axils of the smaller and upper lobes or serratures and distant from the margin, marginal on the small teeth of the larger lobes, involucres broad half-cup-shaped, densely villous, rachis and stipes downy, the latter at length glabrous. *Hook. Sp. Fil.* i. 172;—Davallia villosa. *Wall. Cat.* n. 241—(*not Don.*)

The specimen figured is from the Khasya Hills—(Dr. Thomson.)

Hab. Himalayas, Nepal.

PLATE No. CII.

Microlepia scabra
(Don)

MICROLEPIA.

MICROLEPIA UROPHYLLA. (Wall.) Fronds, (tufted ?) tall lanceolate firm membranaceous, pinnæ elongate lanceolate subfalcate acuminate pinnatifido-lobate, the apices serrated, everywhere glabrous except the costa beneath which is pubescent, unequally cuneate at the base and distinctly petiolate, lobes acute crenato-dentate, veins pinnated, sori along the toothed margin of the lobes, involucres shallow, half-cup-shaped glabrous, or ciliate rachis and stipes slightly downy; the latter at length glabrous;—Davallia calvescens, *Wall. Cat. n.* 2383. *Hook. Sp. Fil.* i. 172;—Davallia urophylla. *Wall. Cat. n.* 2683.

The specimen figured is from the Khasya Hills—(Dr. Thomson.)

Hab. Khasya, Kumaon.

PLATE No. CIII.

Microlepia urophylla (Wall.)

DAVALLIA. (See "Ferns of Southern India," p. 5.)

DAVALLIA SOLIDA. (Sw.) Tall, caudex stout, creeping, clothed with densely imbricated scales, fronds coriaceous tri-sub-quadri-pinnate, pinnæ acuminate, pinnules trapeziform acuminate, pinnatifid many-veined, terminal ones crenato-serrate coadunate into an acuminated point, involucres linear-oblong, sunk in a tooth or segment having a narrow wing on each side or entire. *Hook. Sp. Fil. i.* 163. *Sw. Syn. Fil. p.* 132 *and* 345. *Willd. Sp. Pl.* v., *p.* 470. *Schkh. Fil. i.* 126;—" D. procera, *Hedw. Fil. Fasc.* iv. *tab.* (*in descr.* elegans") *fide Sw.* ——variety *β. latifolia*; pinnules wider, soriferous segments entire (without terminal teeth);—D. ornata, *Wall. Cat. n.* 246;—Stenolobus ornatus Pr. (*name only*) ——variety *γ. caudata*; pinnæ narrower, apices of the pinnules long caudate, involucres with a small incurved terminal tooth on one or both sides, sometimes entire. *D. caudata, Wall. Cat. n.* 2220 *an Sw.* ?—Stenolobus Kunzeanus, *Pr. Tent. Pterid. p.* 130. *t.* 4. *f.* 30, (*name and figure only*);—" D. elegans, *Kze. herb. nec. Swartz*," (*Pr.*);—D. solida *β.* lacera, *Bl. En. Fil. Jav. p.* 234;—Trichomanes solidum, *Forster, Prodr. n.* 475.

The specimen figured is from Moulmein—(Parish.)

Hab. Pacific Islands, Otaheite, New Islands, Pitcairns Island, Malden Island, Java, Moulmein, Penang, Singapore, Luzon, Island of Vanicoro.

PLATE No. CIV.

Davallia
solida (Sw.)

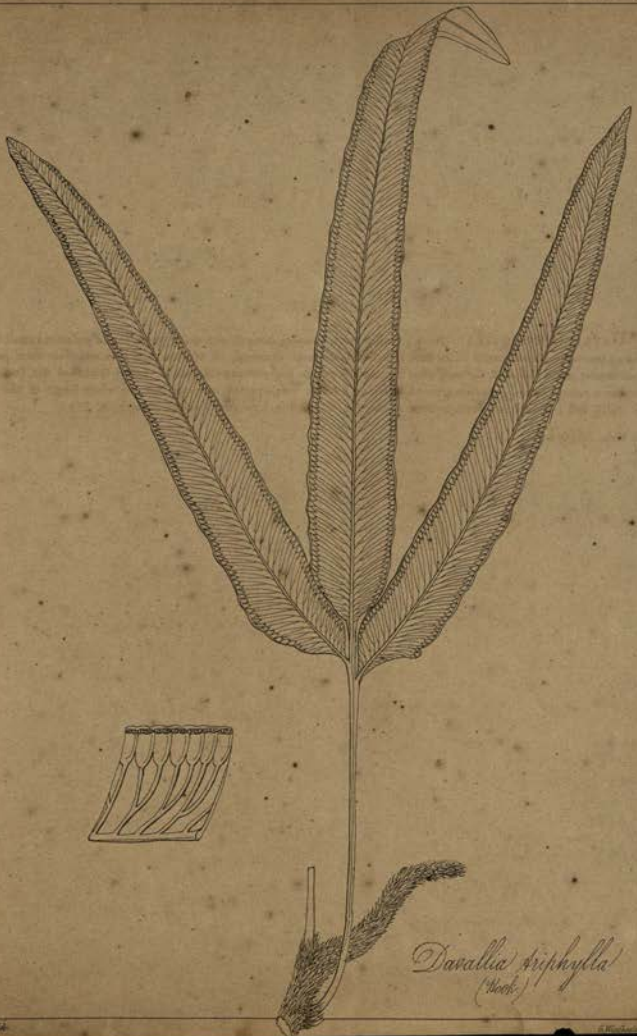
DAVALLIA.

DAVALLIA TRIPHYLLA. (Hook.) Caudex stout, creeping, covered with chaffy scales, fronds coriaceous small ternate, pinnæ oblong-lanceolate, obtuse cuneate at the base, in fertile plants more elongated, all of them entire, intermediate ones petiolate, lateral ones shorter sessile oblique at the base, veins horizontally patent copious crowded parallel forked thickened flat (not prominent), involucres semicylindrical compressed, crowded so as to form an uninterrupted marginal line the whole length of the pinnæ. *Hook. Sp. Fil. i.* 162 ;—Stenolobus pentaphyllus. *J. Sm. En. Fil. Phillip. l. c.*—(*not* Davallia pentaphylla, *Bl.*)

Hab. Singapore.

PLATE No. CV.

PLATE CV.



Davallia triphylla
(Hook.)

DAVALLIA.

DAVALLIA GRIFFITHIANA, (Hook). Caudex long stout creeping, clothed with copious pale-coloured shaggy fimbriate-pilose scales, frond deltoideo-ovate sub-coriaceous, tripinnate, pinnæ acuminate, pinnules oblong lanceolate petiolulate obtuse, obliquely cuneate at the base pinnatifid, lower ones again pinnate, lobes short, obtuse or retuse, almost obsolete on the lower margin, involucres flat orbiculate, the upper half free placed at a distance from the apex of the lobules and chiefly upon those of the superior margin, rachides (except the primary ones) winged, stipes elongated.—*β* more coriaceous, with a faint appearance of striæ or pseudo-veins.—*Hook. Sp. Fil.* i. 168.

The figure is taken from Sir W. Hooker's Species Filicum.

Hab. Khasya, Assam.

PLATE No. CVI.

Davallia Griffithiana
(Hook.)

DAVALLIA.

DAVALLIA POLYANTHA. (Hook). Tall coriaceous, frond 3-4 pinnate, pinnæ distant, ovato-lanceolate acuminate, lower pinnules deeply pinnatifid almost to the rachis petiolate, upper ones and the segments of the pinnules oblong, rather acute, ultimate ones decurrent, so as to form a winged rachis, all of them crenato-serrate, veins pinnated; no striæ, each lobule bearing an oval truncated involucre rather considerably below the apex, with a very short erect tooth on the outside (often obsolete).—*Hook. Sp. Fil.* i, 168.

The figure is taken from Sir W. Hooker's Species Filicum.

Hab, Singapore.

PLATE No. CVII.

Davallia polyantha.

(Hook.)

POLYPODINEÆ.

B. Receptacles effuse, occupying a crowded mass of reticulated veinlets, forming large amorphous portions or separate lobes of the fronds or sometimes definite in form. . . . . PLATYCERIEÆ.

PLATYCERIUM, *(Desvaux, Ann. Soc. Lin. Par. vi. 213.)*

(Neuroplatyceros. *Plukenet. Fée.*;—Alcicornium, *Gaudichaud*;—Scutigera, *Fée.*;—Platyceria, *Fée*;—Acrostichi Sp:, *Auct.*)

Sori superficial, non-indusiate; the *receptacles*, (a series of crowded anastomosing veins), occupying the under-surface of separate lobes or large amorphous portions of the fertile fronds. *Veins* furcate, free, or here and there anastomosing; *venules* anastomosing in large trapezoid or sub-hexagonal elongated areoles; the veinlets free, divaricate or hamate within the areoles.

Fronds heteromorphous, coriaceous, laciniate or lobate, clothed with stellate hairs; the fertile ones articulate. Rhizome subglobose. A very distinct group. The primary veins rarely unite, while the secondary ones are compoundly anastomozed.—(*Moore.*)

PLATYCERIUM WALLICHII, (Hook). Fronds ample, bifarious, at length glabrous; sterile ones imbricated below, irregularly sinuato-lobate above elongated, dilated deeply and much dichotomously pinnatifid. Segments patenti-inflexed; *fertile* fronds geminate very broadly flabellato-cuneate twice—dichotomous suddenly narrowed at the base, each primary division or segment bears a sorus on the disk (hence there are two sori on each frond), which is semi-circular and very much produced in the sinus itself, the terminal segments beyond the soriferous disk are several times dichotomous and pendent, primary veins dichotomous, parallel elevated here and there, anastomosing into broad elongated areoles which are occupied by lesser ones with numerous free-branched included veinlets.—*Hook. Sp. Fil.* v. 284.—*Hook. in Gard. Chron. for Oct.* 1858, *p.* 765, *and in Fil. Exot. t.* 97.—Acrostichum alcicorne, *Wall. Cat. n.* 19. *(not Linn.)*

The specimen figured is from Moulmein—(Parish).

Hab. Moulmein, banks of Irawaddy, and river Martaban, Malay, Peninsula.

PLATE No. CVIII.

Platycerium Wallichii.
(Hook.)

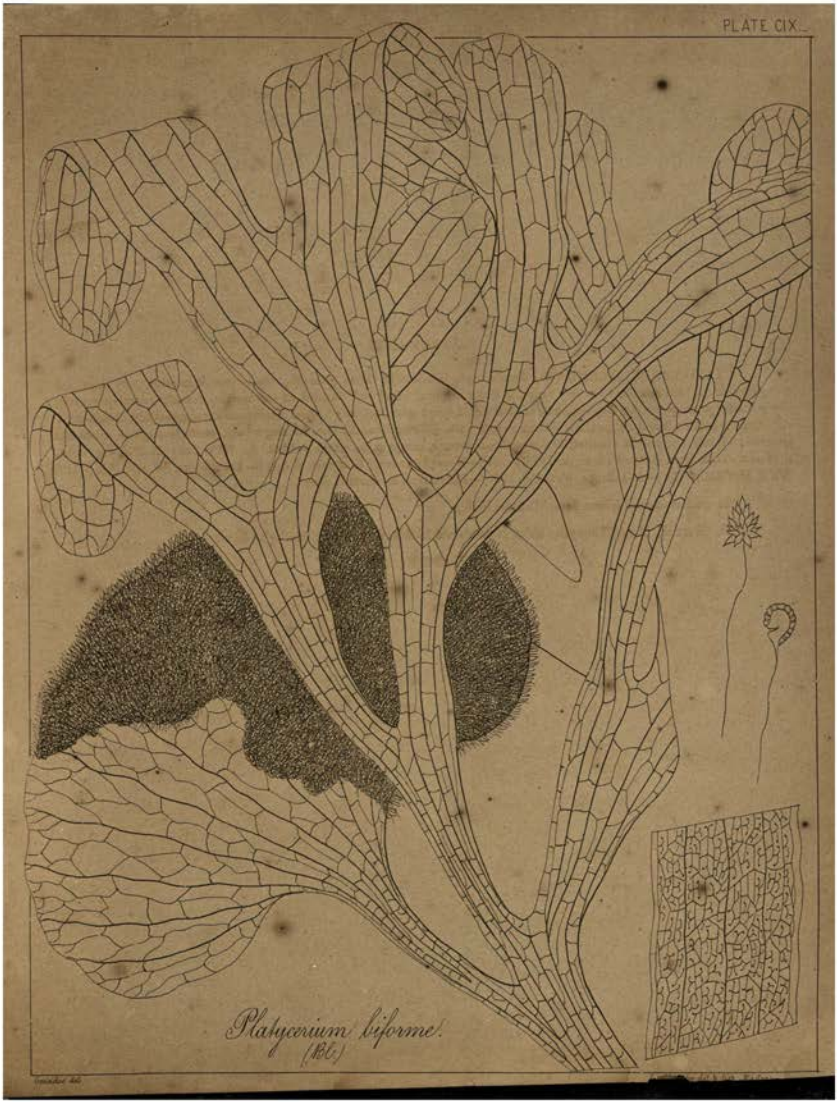
PLATYCERIUM.

PLATYCERIUM BIFORME, (Bl.) Fronds ample, bifarious at length glabrous; *sterile* ones imbricated, very thick and corky towards the base, subrotund but very varied in circumscription, lobed and sinuated at the margin, coarsely reticulato-venose; *fertile* fronds (geminate?) rather long—stipitate of great size, 5-6 and more feet long!—from a subcuneate base repeatedly dichotomous the segments loriform flaccid and pendent, fertile segments quite different from the rest, forming a large reniform stipitate shield-like receptacle 6-8 inches or more in diameter, wholly soriferous beneath, except at the margin.—*Hook. Sp. Fil. v.* 235; *Bl. Fil. Jav. p.* 14. *t.* 18,. *Pr. J. Sm. Hook. in Gard. Chron. for* 1858, *p.* 764;—Neuroplatyceros, *Fée. Acrost. p.* 104;—Acrostichum, *Sw. Syn. Fil. p.* 112; *Willd. Sp. Pl. v. p.* 111;—A fuciforme, *Wall. Cat. n.* 20;—Platycerium coronarium, *Desv.*

The specimen figured is from Java, (Calcutta Herb.)

Hab. Burmah, Mergui, Singapore, Malay Peninsula and Islands, Java, Borneo, Philippine Islands.

PLATE No. CIX.



Platycerium biforme.
(Bl.)

POLYBOTRYA. (See "Ferns of Southern India," p. 66.)

POLYBOTRYA APPENDICULATA. *Var.* β *costulata.* (Hook.) Sterile pinnæ deeply pinnatifid ½-¾ of the way to the rachis, costulate with simple patent veins, lowest pair of pinnæ half-deltoid, bi-pinnate at the base, pinnules 1½ to 3½ inches long, deeply pinnatifid, like the primary pinnæ, fertile pinnæ also with the lower pair in like manner pinnated as in the sterile fronds.—(*Hook.*)

The specimen figured is from Moulmein, from Mr. Parish, who informs me that he considers it quite distinct as a species from B. appendiculata, of which, however, Sir W. Hooker considers it a variety only—it is a beautifully delicate plant.

Hab. Moulmein.

PLATE No. CX.

Polybotrya appendiculata var. caudulata.
(Hook)

POLYBOTRYA.

POLYBOTRYA APPENDICULATA. (Wild.) (See "Ferns of Southern India," p. 66.)

The plate contains figures of 3 different varieties of this species, all received from Moulmein, from Mr. Parish. The second supposed species, common in India and published in Plate CXCV. of "The Ferns of Southern India," under the name of *P. asplenifolia*, (Bory.) must, I am afraid, be looked upon only as a variety of appendiculata.

PLATE No. CXI.

Polybotrya appendiculata.
(Wild.) varietas.

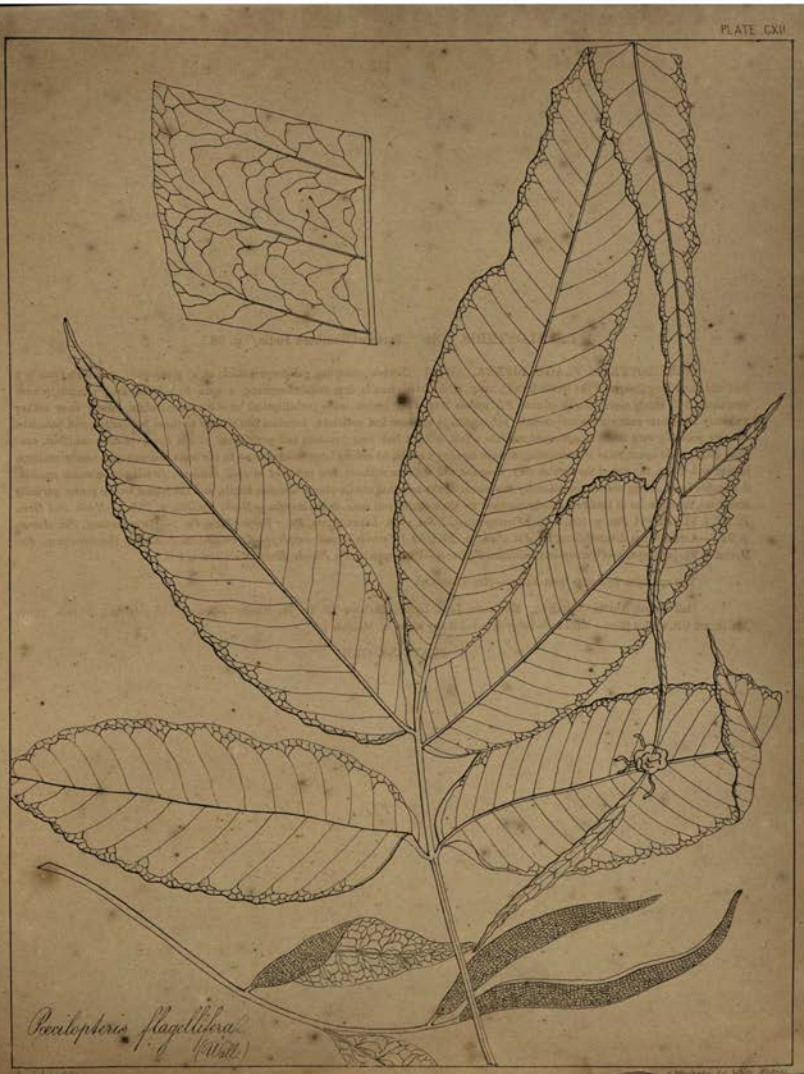
PÆCILOPTERIS. (See " Ferns of Southern India," p. 68.)

PÆCILOPTERIS FLAGELLIFERA, (Wall.) Caudex creeping, paleaceous, thick as a goose quill, stipites a span to a foot and more long (longer of the fertile frond), scaly at the base, fronds firm-membranaceous, a span to 1-2 feet long pinnate, pinnæ commonly 3-5, rarely more ; *sterile* pinnæ, 3-5 inches long, 1½-2 inches wide ; subelliptical or oblongo-lanceolate, lateral ones rather suddenly acuminate entire or sinuato-crenate, subcuneate at the base and petiolate, terminal one similar to these but larger, and petiolate or more generally very much elongate and caudate, a foot or 1½ 2 feet long ! rooting and proliferous at the apex, venation manifest, costules rather wide apart, veins anastomozing, always forming a series, of oblong large areoles close to the costa and costules, nearly uniform in size and shape, the rest of the areoles very irregular and with or without free included simple veinlets ; *fertile* pinnæ much smaller, 2-3 inches long, oblong obtuse ; occasionally the cauda of the terminal sterile pinnæ becomes fertile, and the lateral *sterile* pinnæ partially soriferous, the capsules in that case chiefly confined to the costules and near to the margin.—*Hook. Sp. Fil.* v. 258. ;—*Hook. and Grev. Ic. Fil. t.* 23. ; *Bl. Fil. Jav.* p. 104, *t.* 13. ; Cyrtogonium, *J. Sm.* ;—A heteroclitum, *Pr.* ; Pæcilopteris, *Pr.* ;—Heteroneuron, *Fée. Acrost.* p. 92 ;—Acrostichum diversifolium, *Bl. Fil. Jav.* p. 36, *t.* 12 ? (*sterile frond simple*) !—Cyrtogonium, *J. Sm.* ;—Heteroneuron, *Fée. Acrost.* p. 91. (*excl. syn.* ;—Gymnopteris trilobata, *J. Sm.* ;)—Pæcilopteris, *Pr. Rheede. Hort. Malab.* x. ii *t.* ii.

The specimen figured is from Assam—(Dr. Thomson).

Hab. Nepal, Assam, Chittagong, Moulmein, Java, Luzon, Malabar (if Sir W. Hooker is correct in referring Rheede. Hort. Malab. xii. *t.* ii. to this plant—but I have never detected it any where in Malabar)

PLATE No. CXII.



Pecilopteris flagelifera
(Wall.)

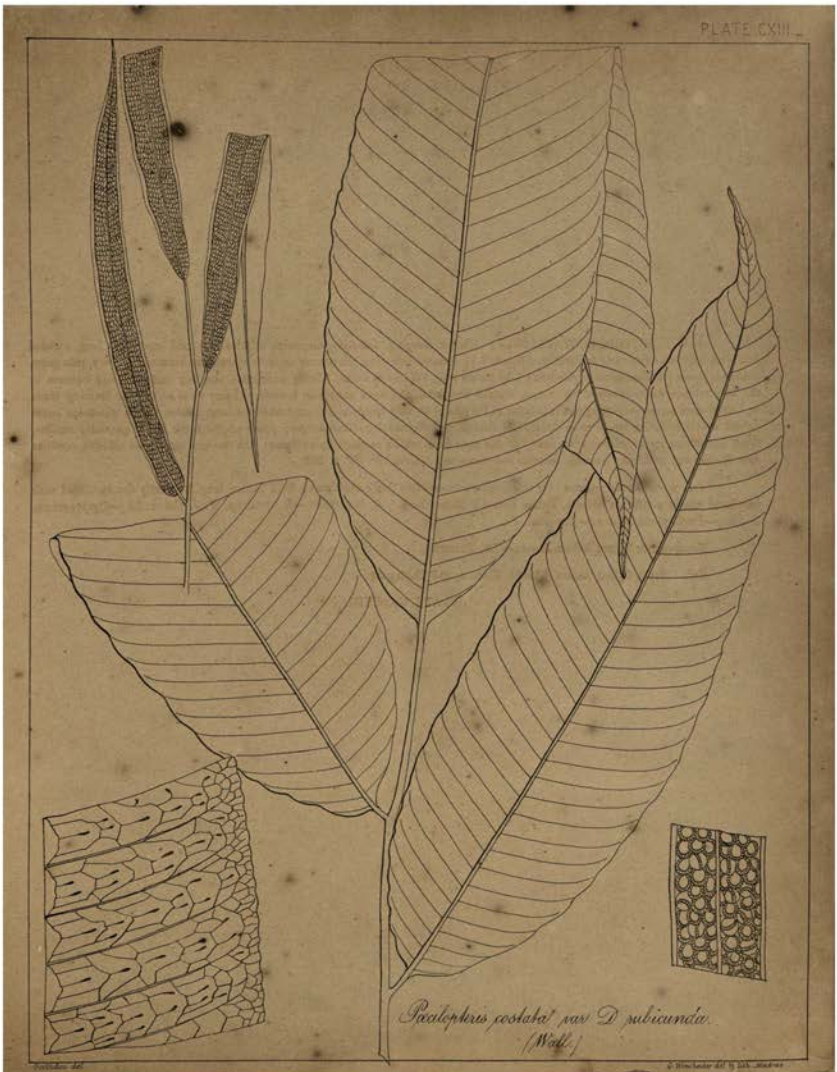
PÆCILOPTERIS COSTATA. (Wall.) Caudex creeping, subulato-paleaceous, stipites 1-1½ and more feet long, striated and often here and there rusty-furfuraceous, fronds 1-1½ or more feet long, coriaceous or subcoriaceo-membranaceous, very pale-green pinnated, pinnæ petiolate of the *sterile* frond 7-10 inches long, 1-2 inches broad, oblong acuminate, obtusely and obliquely cuneate at the base, entire sinuato-crenate at the margin, costules horizontal, and costa prominent beneath, primary veins arched and forming three or four or more series, (according to the breadth of the pinnæ) of very irregular but sub-transverse large areoles, within which are lesser deltoid areoles, including two or more clavate free veinlets, free veinlets also at the margin; pinnæ of the *fertile* fronds generally smaller, 2-3-6 inches long, more coriaceous but nearly of the same form, wholly or partially soriferous, the margin sometimes reflexed, costules very distinct and prominent beneath, venation less compound. *Hook. Sp. Fil.* v. 262.

Var. *a, rubicunda;* pinnæ very large, subcoriaceous often finely acuminated, 8-12 inches long, frequently deeply tinged with purple-red wholly soriferous beneath, fertile ones 6-9 inches long, ½ an inch wide;—A. costatum, *Wall. Cat. n.* 26;—Cyrtogonium, *J. Sm.*;—Pœcilopteris, *Moore*;—Campium, *Pr.*

The specimen figured is from Assam—(Dr. Thomson).

Hab. Nepal, Sylhet, Assam, Khasya, Kumaon, and Chittagong.

PLATE No. CXIII.



Pœcilopteris costata var D. subicunda.
(Wall.)

Gordon del. G. Winchester del. & lith. Madras

PÆCILOPTERIS.

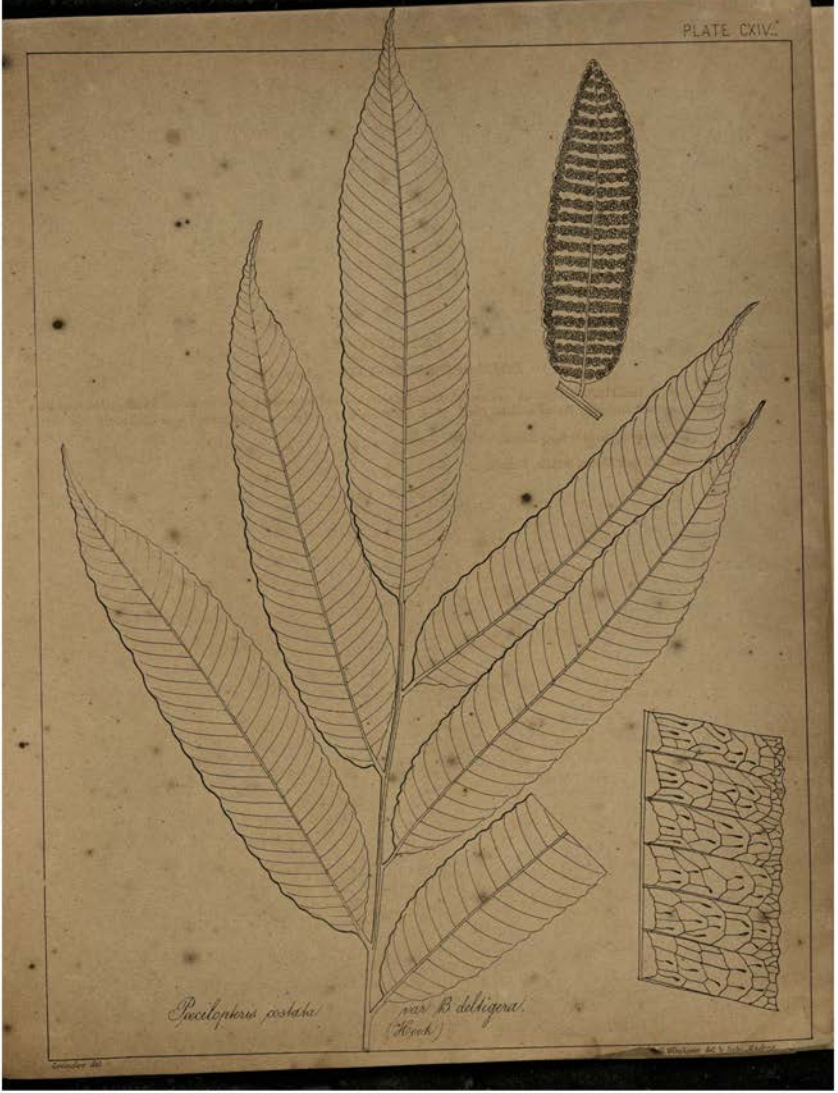
PÆCILOPTERIS COSTATA. (See p. 113.)

Var. β, DELTIGERUM ; small, sori partial, generally marginal and interrupted, spots or masses forming transverse lines between the costules, frequently having a deltoid form. *Hook. Sp. Fil.* v. 262 ;—Meniscium deltigerum. *Wall. Cat. n.* 59.

The specimen figured is from Birmah—(Captain Dormer).

Hab. Nepal, Bhotan, Sikkim, Birmah.

PLATE No. CXIV.



Pœcilopteris costata var. *B deltigera.*
(Hook)

PÆCILOPTERIS.

PÆCILOPTERIS COSTATA. (See, p. 113).

Var. γ. UNDULATA; resembling var. β, but the sori frequently only marginal, forming a broad band, but often extending a little way down between the costulæ towards the costa, the disk of the pinnule naked; Nothochlæna undulata. *Wall. Cat.* n. 140;—Jenkinsia, *Hook. Gen. Fil. t.* 75, *Moore*;—Campium. *Pr.*;—Cyrtogonium, *f. Sm.*;—Lomariopsis, *Mettn*;—Heteroneuron sculpturatum, *Fée, crost p.* 95, *t.* 56, *judging from the figure*—(*Sori universal on the pinnæ*).

The specimen figured is from Moulmein—(Parish).

Hab. Martaban, Moulmein, Khasya, Sikkim.

PLATE No. CXV.

Pteris costata var. γ *undulata*
(Hook.)

GYMNOPTERIS. (See "Ferns of Southern India," p. 15).

GYMNOPTERIS MINUS (Metten). Small caudex creeping, thick as a sparrow's quill, scaly at the apex, stipites remote slender 1-3 or in those of the fertile frond 4 inches long; *Sterile* fronds membranaceous, 1½-2 inches long, oblong or broad—lanceolate costate tapering into a stipes 2½ inches long, costules indistinct, areoles with a free included clavate, veinlet smaller towards the margin; *fertile* fronds 2 inches long, linear obtuse.—*Hook. Sp. Fil. v.* 277. *Metten. Fil. Hort. Lips., p.* 20;—Leptochilus, *Fée. Acrost. p.* 87, *t.* 47, *f.* 2. *according to his figure (exel. Syn. J. Sm.)*;—Gymnopteris, *Hook. 2nd Cent. of Ferns, t.* 78.

The specimen figured is from Khasya—(Calcutta Herb.)

Hab. Khasya near Churra, alt. 2,000 = 3,000 feet, Isle of Samar, Philippines.

PLATE No. CXVI

Gymnopteris minus
(Mett)

TÆNIOPSIS. (See " Ferns of Southern India," p. 18.)

TÆNIOPSIS AMBOINENSIS (Fée.) " Fronds smooth, submembranaceous, falcate acuminate tapering below into a petiole, costa slender, disappearing below the apex, veins curved equal approximate, sori closely marginal, cuticle of the margin resembling a false involucre, caudex flexuose, contorted scaly, scales cancellate, rigidly toothed at the margin."—*Hook. Sp. Fil. v.* 177. *Fée. Vittar. p.* 44, *t.* 1, *f.* 1.

The veins are combined where fertile by an intra-marginal vein which runs along the centre of the receptacle, I could not, however make out from my solitary specimen if this vein is present where the frond or portion of the frond is sterile.

The specimen figured is from Birmah—(Parish.)

Hab. Birmah, Amboyna.

PLATE No. CXVII.

Ixeniopsis Amboinensis.
(Ire.)

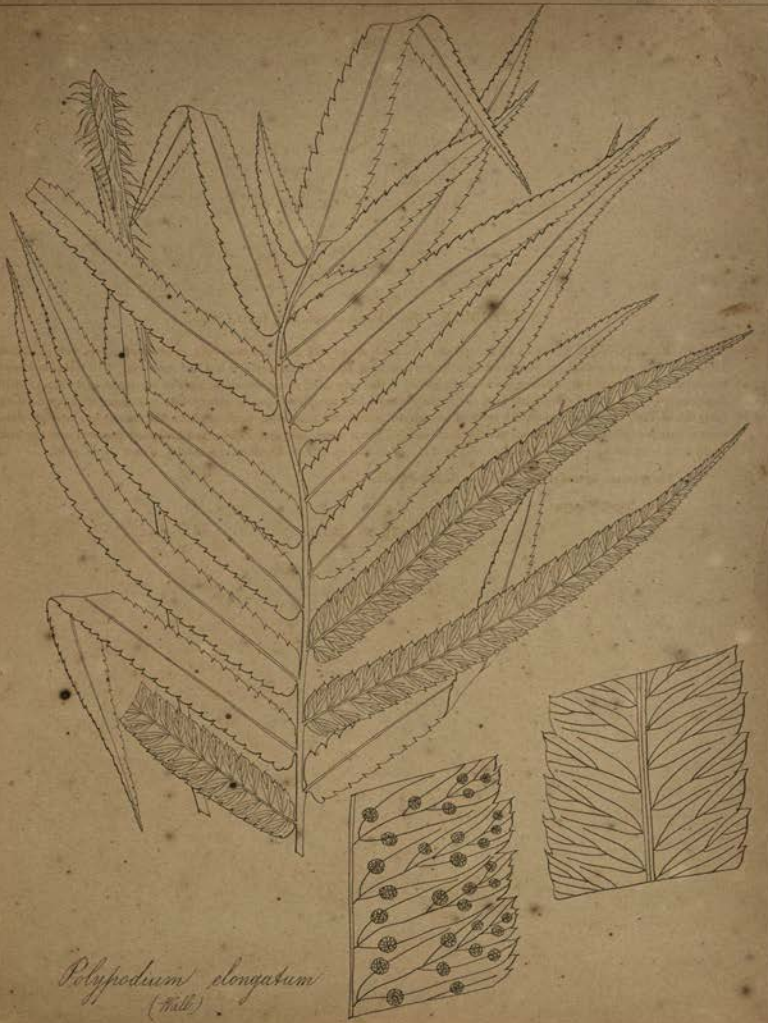
POLYPODIUM. (See "Ferns of Southern India," p. 55).

POLYPODIUM ELONGATUM. (Wall.) Caudex ? stipes 1-1½ foot and more long, stout tawny-brown, very paleaceous below with dark castaneous glossy falcato-subulate long acuminated scales, fronds ample, 2 feet and more long, 6-10 inches and more broad, thin firm-coriaceous ovato-oblong acuminated pinnated to the very apex, pinnæ numerous, more or less patent and distant. 5-10 inches long, ½ an inch broad subpetiolate from an obliquely cuneate, but not dilated, (rarely subauricled) base linear or elongato-oblong, finely acuminated, the margin pinnatifid subduplicato-serrated, serratures subspinose, terminal pinnæ like the rest but more petiolate, veins copious fasciculato-pinnate, veinlets each of them bearing a dorsal sorus, and thus copious and irregularly scattered over the back of the frond or in irregular series. *Hook. Sp. Fil.* iv. 234. *Wall. Cat. n.* 309 ;—Aspidium cuspidatum, *Metten. Aspid. p.* 92.

The specimen figured is from Khasya— (from the Ceylon Herb.)

Hab. Nepal, Khasya.

PLATE No. CXVIII.



Polypodium elongatum
(Wall)

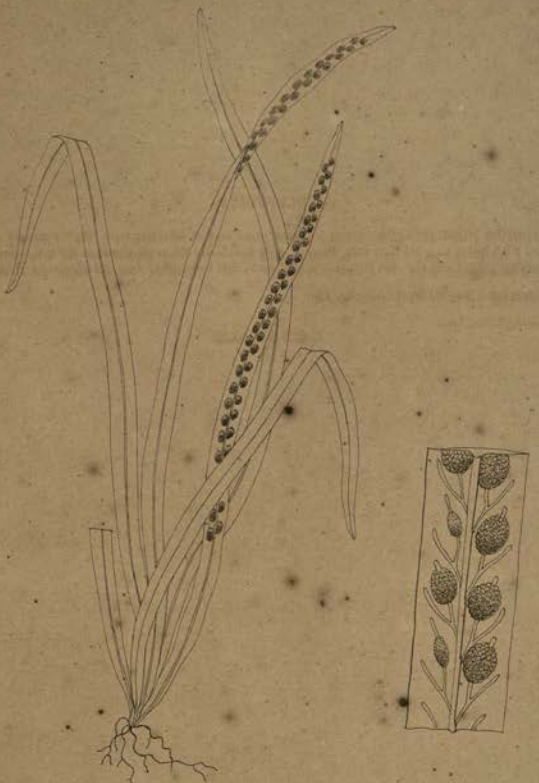
POLYPODIUM.

POLYPODIUM SESSILIFOLIUM. (Hook.) Caudex small, erect or ascending scaly, stipites scarcely any, fronds tufted membranaceous firm 3-8-9 inches long, 2-3 lines wide, linear scarcely acuminated obtuse attenuated at the base, veins oblique, approximate simple, sori oblong, parallel with the costa in lines or series intermediate between the costa and the margin. *Hook. Fil.* iv. 168.

The figure is taken from Sir W. Hooker's Sp. Fil.

Hab. Penang, Luzon, Java.

PLATE No. CXIX.



Polypodium sessilifolium.
Kirk.

NIPHOBOLUS. (See "Ferns of Southern India," p. 64.)

NIPHOBOLUS COSTATUS. (Wall.) Caudex creeping, rufo-palaceous with slender subulate scales, stipites sub aggregate, 1 inch to a span long angled, fronds a span to 1½-2 feet and more long, 1-2-3 inches and more broad firm (but not apparently carnose)—coriaceous even sub-membranaceous, in age glabrous above, beneath densely stellato tomentose and subfurfuraceous (tomentum forming a close coat), lanceolate or sub-oblanceolate acuminate, gradually tapering below and decurrent upon the stipes, primary veins or costules distinct, elevated on the under side, sori immersed, very minute and numerous, arranged in compact closely placed lines or series between the costules and in equally-compact series tranversely with them. *Hook. Sp. Fil.* v. 50. *Wall. Cat. p.* 265. *Metten. Polyp. p.* 131, *t.* 3, *f.* 14, (*venation*);—Niphobolus, *Pr.*;—Apalophlebia, *Pr. Epim. p.* 138;—Niphob. venosus, *Bl. Fil. Jav. p.* 63, *t.* 28 (*very good; but small fronds*);—Apalophlebia, *Pr. Epim. p.* 139.

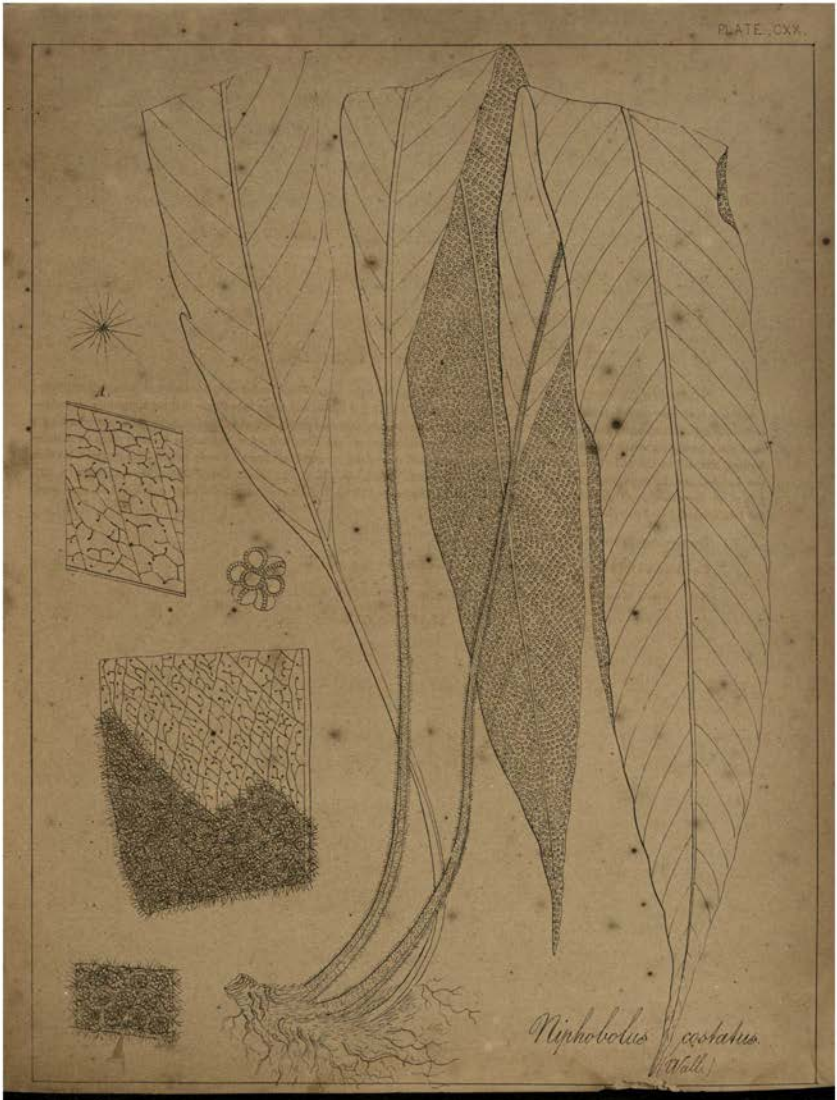
The specimen figured is from Moulmein—(Parish).

Fig. A shows the venation (between the costules) considerably magnified.

Hab. Nepal, Khasya, Assam, all along the Himalayas, from Kumaon to Sikkim, Moulmein, Java, New Guinea.

PLATE No. CXX.

PLATE. CXX.



NIPHOBOLUS.

NIPHOBOLUS PENANGIANUS. (Hook.) Caudex ? Stipes scarcely any, fronds submembranaceous, 1½ foot and more long, 2½ inch wide, oblanceolate finely acuminate, the base much and gradually attenuated sessile, the margin irregularly sinuated glabrous above (at least in maturity), beneath thinly clothed with fuscous stellated hairs, venation internal, but manifest when viewed between the eye and the light, costules not elevated, areoles 16-18 between the costa and the margin including 2 to 4 simple or forked clavate soriferous veinlets, sori prominent (not sunk), forming a broad mass in the disk of the upper half of the frond arranged with great regularity in four longitudinal series parallel with the costules and within each areole are transverse lines, each of four sori, capsules mixed with long-stipitate peltate stellated scales. *Hook. Sp. Fil.* v. 52. *Hook. Ic. Pl.*, t. 203. *Gen. Fil.* 83. *Polycarpium, Pr:*

The specimen figured is from Birmah—(Parish).

Hab. Birmah, Penang.

PLATE No. CXXI.

Nephrolepis Penangiana.
Hook.

PLEOPELTIS. (See "Ferns of Southern India," p. 57.)

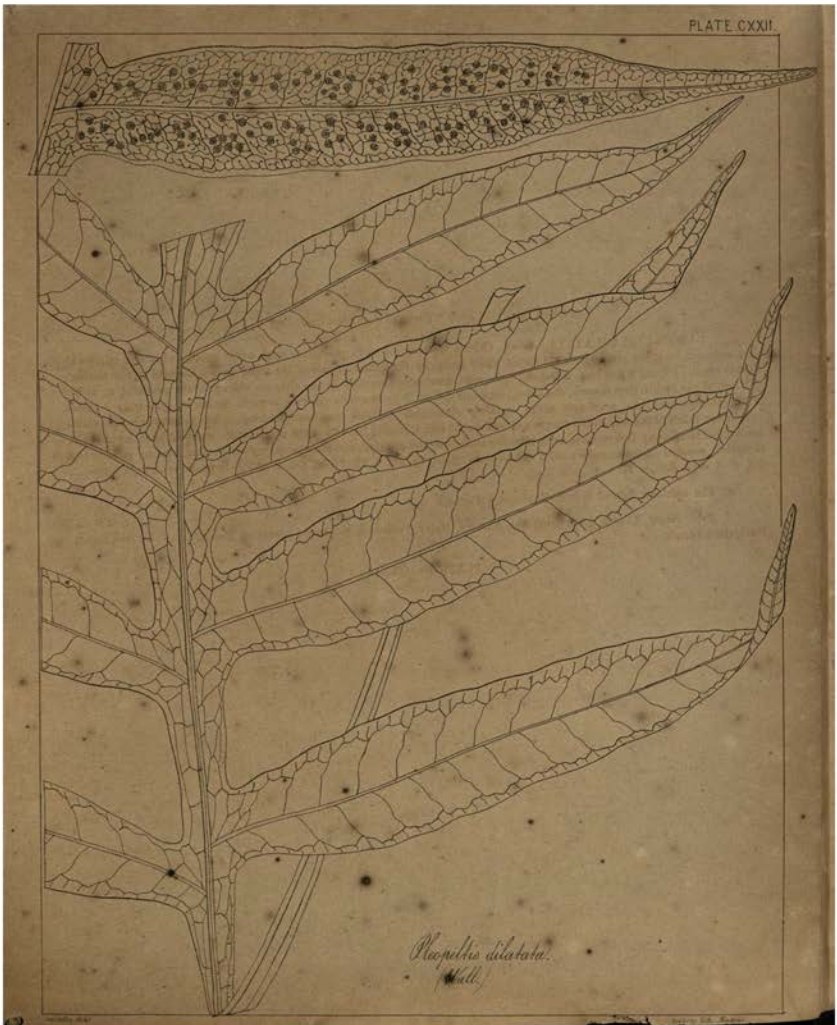
PLEOPELTIS DILATATA. (Wall). Caudex creeping (short ?), paleaceous with ovate reticulated scales, stipites 1½ foot and more long, but strongly winged for its whole length by the decurrent base of the frond (not articulated on the caudex), fronds ample 1½-2 and 3 feet long, a foot and more wide, membranaceous light-green, glabrous oblongo-ovate pinnatifid to within ½-1 inch of the rachis (less towards the base), segments 5-6 or 8 inches long (shorter towards the apex), ¾-1 rarely 2 inches wide, oblongo-lanceolate acuminate entire suddenly decurrent, costules veniform forming large primary areoles which extend two-thirds of the way to the margin and include the sori, these and the rest of the segments are occupied by lesser irregular areoles including many free veinlets, their branches moderately divaricating, sori numerous, very small, often oval or more or less elongated, compital on the secondary veins and veinlets. *Hook. Sp. Fil.* v. 85. *Wall. Cat. n.* 295 ;—Drynaria acuminata ! *Brack. Fil. U. S. Expl. Exp., p.* 47.

The specimen figured is from Moulmein—(Parish.)

Hab. Nepal, Khasya, 4,000 6,000 feet, Malacca, Malay Peninsula, Moulmein, ascent of Mooleit, alt. 4,000 feet, Samoa Navigator's Islands.

PLATE No. CXXII.

PLATE CXXII.



Pleopeltis dilatata.
(Hall.)

PLEOPELTIS.

PLEOPELTIS ZOSTERIFORMIS. (Wall.) Caudex short, fragile black, creeping apparently under ground or rather under water, scaleless, stipites very slender, weak and filiform, ½-1 inch long aggregated, fronds 4-6 inches long less than ¼ of an inch wide, carnoso-membranaceous black when dry, linear vittarioid scarcely acuminate, subacute entire, gradually long-attenuated below into the thread-like stipes, costa prominent beneath and scaly with blackish appressed somewhat fleshy small ovate scales, venation very distinct when seen between the eye and the light, costules none, veins anastomosing, so as to form 2-3 series of large parallel but very irregular areoles with no free veinlets. Sori in a single but irregular series between the costa and the margin, capsules lax. *Hook. Sp. Fil.* v. 65. *Wall. Cat.* n. 280. *Mett. Polyp. p.* 86 (*venation.*)

Nearly allied to P. tridactylon. Wall. at least to the Southern Indian form.

The specimen figured is from Birmah—(Parish.)

Hab. Birmah.

PLATE No. CXXIII.

Pleopeltis zosteraformis.
(Wall.)

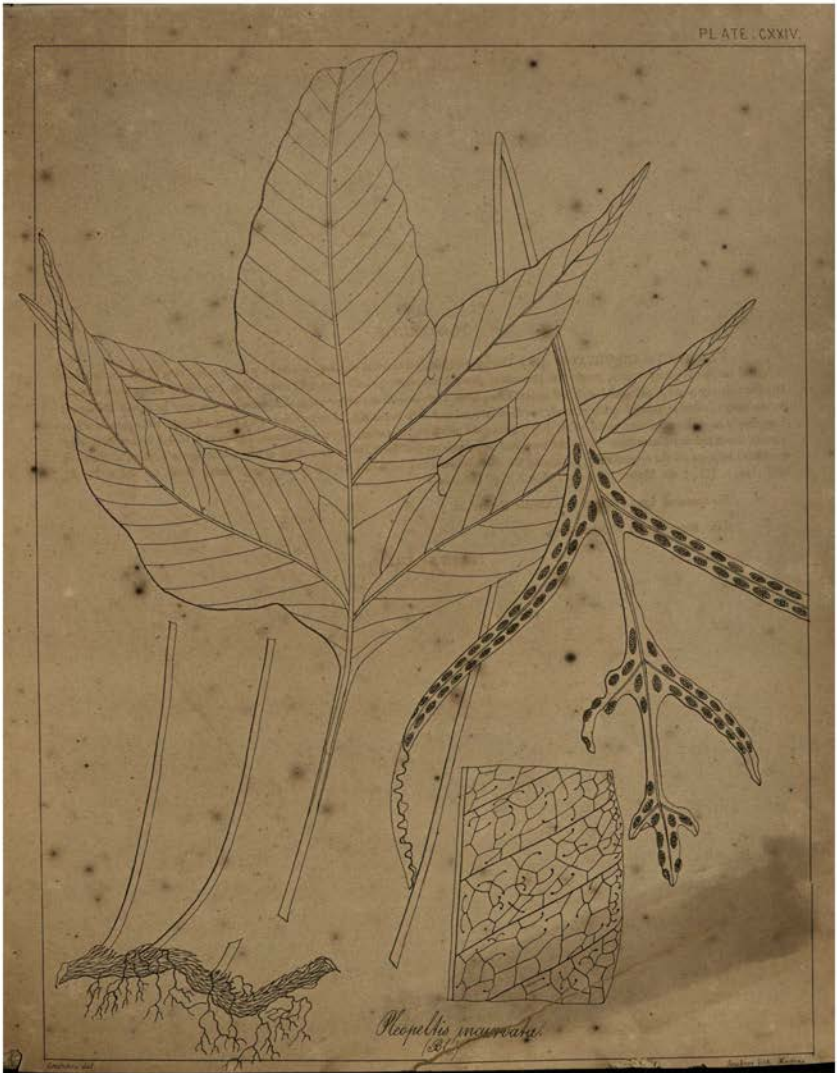
PLEOPELTIS.

PLEOPELTIS INCURVATA. (Bl.) Caudex creeping, paleaceous, stipites scattered a span to a foot long of the *sterile* frond-2 feet of the *fertile* glossy-brown, fronds firm-coriaceous glossy dimorphous; *sterile* ones 6-10 inches long, 8 inches to 1 foot wide, hastate, tripartite simply ovate or pinnatifid with 4-6 lateral lobes, lobes ovato-acuminate entire horizontal, terminal one very large, all thickened at the margin, costules distinct but immersed, venation internal and very indistinct; *fertile* fronds very long, stipitate 10 inches to a foot long, nearly as much wide, very broad, ovate deeply pinnatifid nearly to the rachis, below subpinnate, segments 5-15-4-8 inches long, very remote linear and acuminate decurrent at the base, sori large, copious oval sunk into a very deep cavity which forms a circular elevated truncated tubercle on the opposite side, occupying the space between the costa and the margin in a single series. *Hook. Sp. Fil.* v. 77. *Bl. Fil. Jav.*, *p.* 151., *t.* 65. *Metten. Polyp.*, *p.* 106, *t.* 1, *f.* 30 (*venation.*)

The specimen figured is from the Calcutta Herbarium.

Hab. Mount Ophir, Malacca, Java.

PLATE No. CXXIV.



Pleopeltis incurvata.
(Bl.)

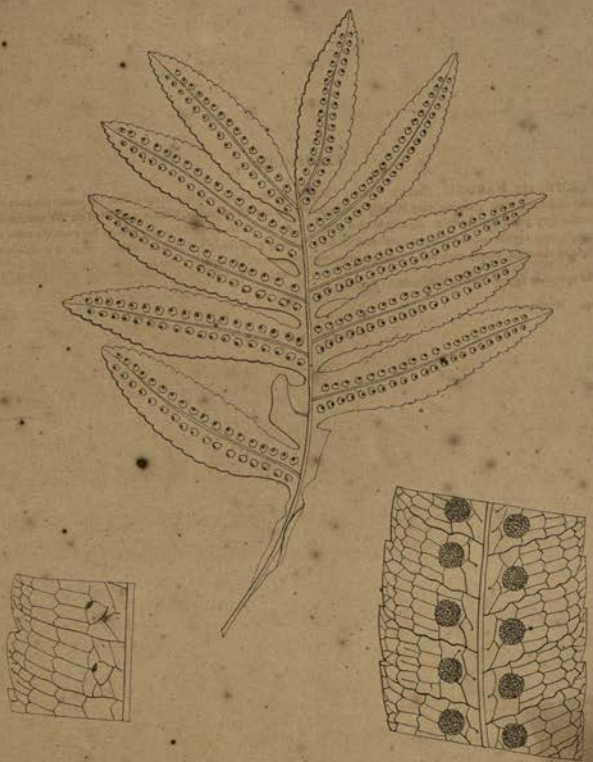
PLEOPELTIS.

PLEOPELTIS PARISHII (Bedd.) Caudex ↑ Stipites short and more or less winged with the decurrent base of the frond, fronds coriaceo-membranaceous glabrous, very broadly ovate, deeply pinnatifid segments, obtuse undulated on the margin and distantly crenated, venation very prominent, costules slightly thicker than the veins which latter form 4-5 areoles between the costa and margin, veinlets forming a very regular series of lesser parallelogrammoid areoles with rarely a few free veinlets. Sori in a single series in the second areole from the costa, deeply sunk and forming a prominent pustule on the upper surface.

The specimen figured is from Moulmein—(Parish.)

Hab. Moulmein.

PLATE No. CXXV.



Pleopeltis Parishii.

(Bedd.)

POLYSTICHUM. (See "Ferns of Southern India," p. 41.)

POLYSTICHUM THOMSONI. (Hook.) Caudex short thick scaly, stipites tufted 1-3 4 inches long paleaceous with large scales, fronds 6-8 inches long, lanceolate acuminate chartaceo-membranaceous pinnate, pinnæ sub-sessile, 1 to 4 inches long, deltoid-ovate or semi-ovate acute subauricled and deeply pinnatifid (especially at the superior margin), lobes small, ovate inciso-serrate, teeth setoso-spinulose, sori solitary on each lobe, involucre subovate membranaceous peltate pedicellate, the margin suberose. *Hook. Sp. Fil.* iv. 7. *Hook. 2nd Cent. of Ferns, t.* 25.

The specimen figured is from Sikkim—(Dr. Thomson.)

Hab. Sikkim, Himalaya, Kumaon, elev. 9 to 13,000 feet, Simla.

PLATE No. CXXVI.

Polystichum Thomsoni
(Hook.)

POLYSTICHUM.

POLYSTICHUM SIKKIMENSE. (Bedd.) Caudex ? Stipes and rachises rather copiously furnished with persistent scales, fronds ovate acuminate, subcoriaceo-membranaceous, tripinnate primary pinnæ 4-6 inches long, oblong acuminate, pinnules oblong, deeply pinnatifid, ½ an inch to 1 inch long, secondary pinnules variously pinnatifid with the segments acuminate and falcate, costa of the pinnules waved, veins simple or forked, terminating within the margin, sori generally one to each segment, involucre sub-orbicular peltate stalked, with the stalk below the centre.

The specimen figured is from Sikkim—(Dr. Thomson.)

Hab. Sikkim, Himalaya.

I forwarded specimens of this fern lately to Sir W. Hooker, who pronounced it to be an undescribed species, and informed me that he intended publishing it in his synopsis, under the name of *Nephrodium* (*L*). *Thomsoni*—the involucres, however, in specimens which I received from Dr. Thomson, and in others lately collected by Dr. Anderson are always those of *Polystichum*, and not *Lastrea*, and there is already a *Polystichum Thomsoni*.

PLATE No. CXXVII.

Polystichum Sikkimense

Baker

POLYSTICHUM.

POLYSTICHUM LONCHITIS. (Sw.) Caudex short, stout oblique, densely paleaceous as are the short stipites, and lower portion of the rachis with ferruginous large scales, fronds 6-18 inches long, densely tufted, erect rigid lanceolate tapering at both ends pinnated, pinnæ numerous, approximate from a broad nearly sessile obliquely truncated base, ovate or lanceolate, falcate acute rather than acuminate spinuloso-serrate, the superior base truncated and auriculate, sori confined to upper portion of the frond in two or more series upon the pinnæ.*Hook. Sp. Fil.* iv. 8 *Sw. Syn. Fil. p.* 43. *Willd. Sp. Pl.* iv. *p.* 224. *Sm. Fil. Brit. p.* 1118. *Engl. Fil.* iv. *p.* 284. *Schk. Fil. p.* 29, *f.* 29, *Metten. Aspid. p.* 41.*Hook. Et. Arn. Brit. Fl. ed.* 8. *p.* 582, *Hook. Brit.Ferns. t.* 9 ;—Polypodium,*Linn. Sp. Pl. p.* 1548.*Engl Bot. t.* 796. *Polystichum, Roth. Fl.* 1. *Germ.* iii. *p.* 71. *Prest. Moore Brit. Ferns Nat. Print, t.* 9.

The specimen figured is from the N. W. Himalaya—(Dr. Stewart.)

Hab. Temperate and cooler parts of Europe, Michigan, U. States, Lake Superior, British Columbia, N. W. India.

PLATE No. CXXVIII.

Polystichum Lonchitis.
(Sw.)

NEPHRODIUM. (See "Ferns of Southern India," p. 29.)

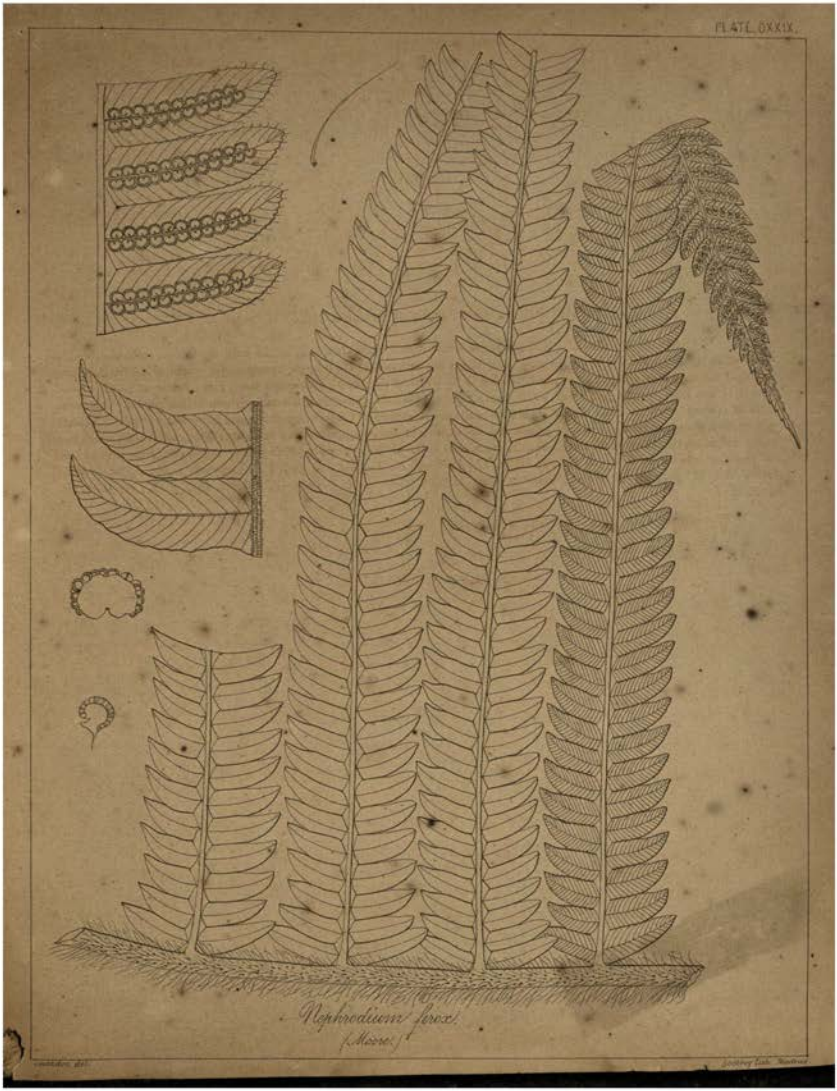
NEPHRODIUM FEROX. (Moore). Stipes robust, 2 and more feet long, crinite with coarse long subulate blackish scales which more or less extend to the rachides, each bristle-like hair seated on a tubercle, fronds ample, probably several feet long, very rigid and coriaceous, glossy, 2-3 feet broad, (judging by the length of the pinnæ), glabrous pinnated, pinnæ numerous, sessile approximate 1-1½ foot long, often an inch broad, sessile from a truncated base, elongato-oblong falcate finely acuminated, regularly (about one-third of the way down from the margin), pinnatifid with ovate acute, pungent falcate segments, costa and costules prominent beneath, veinlets close, placed, elevated, six to eight pairs united and excurrent forming a pseudo-costule as distinct as the costule from which they spring and which terminates at the sinus, sori in two rows close to the costule apparently forming a single brown transverse line or band not prolonged into the segments. *Hook. Sp. Fil.* iv. 77. *Aspidium, Bl. En. Fil, Jav., p.* 153;—Goniopteris aspera, *J. Sm. in Hook. Journ. Bot.* iii., *p.* 396;—Polypodium asperum, *Roxb. in Herb. Linn.* (*fide J. Sm.*);—P. scabrum. *Herb. Roxb.* (*fide Wall. Cat.* n. 2225.)

The specimen figured is from the Calcutta Herbarium.

Hab. Kumaon, Luzon, Java.

PLATE No. CXXIX.

PLATE CXXIX.



Nephrodium ferox.
(Moore.)

Vandyke del. Lockey lith. Madras

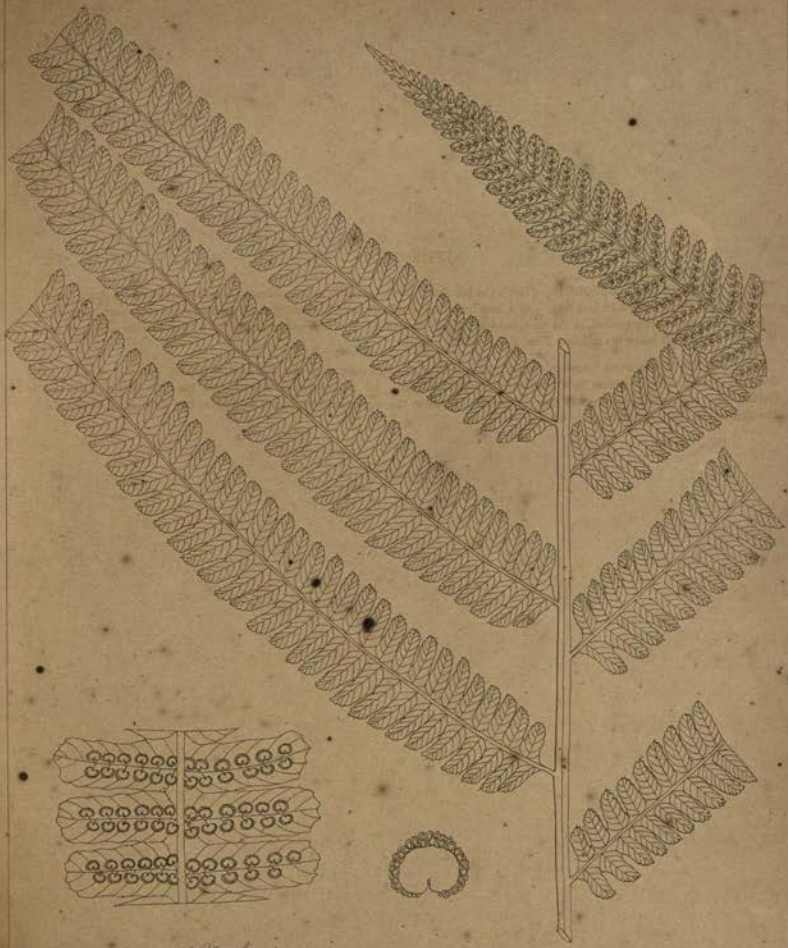
NEPHRODIUM.

NEPHRODIUM EUSORUM. (Thw.) Caudex short, fronds glabrous or sub-glabrous lanceolate acuminate pinnate, pinnæ numerous, linear acuminate 5-10 inch long, ½ to 1 inch broad, sub-sessile pinnatifid, generally about ½ way down to the rachis, segments truncated, unconspicuously toothed at the apex, veinlets 6-8 pair, the lower pair always and generally the 2 lower anastomosing, sori one to each veinlet a little below the middle. *Thw. En., p.* 391.

Mr. Thwaites, to whom I am indebted for the specimen of this fern, informs me that he considers it quite distinct from the Nep. abruptum (Presl.), to which species Sir W. Hooker is inclined to refer it. All my specimens of *abruptum* have the pinnæ much less divided, and 3 to 6 (never less than 3) pair of veinlets anastomose, the segments of the pinnæ are besides very different in shape. Mr. Thwaites has had both species under cultivation.

Hab. Ceylon.

PLATE No. CXXX.



Nephrodium jusorum

NEPHRODIUM.

NEPHRODIUM PUNCTATUM. (Parish.) Caudex a creeping rhizome, stipites solitary distant 1-2 feet long with a few small subulate scales at the base, fronds 3-4 feet high broadly ovate, pinnate throughout their whole length. Pinnæ alternate linear apiculate, from 8 inches in the lowest to 12-16 inches long; in the centre over ¾ inches broad, becoming suddenly shorter at top of frond, pinnatifid half way to the costa-pinnules subfalcate; sori marginal all round the pinnules sunk in the substance of the frond so as to give a punctiform appearance on the upper surface. (Parish.)

The specimen figured is from Moulmein—(Parish.)

Hab. Moulmein, damp jungles, rare.

PLATE No. CXXXI.

Nephrodium punctatum.
(Parish.)

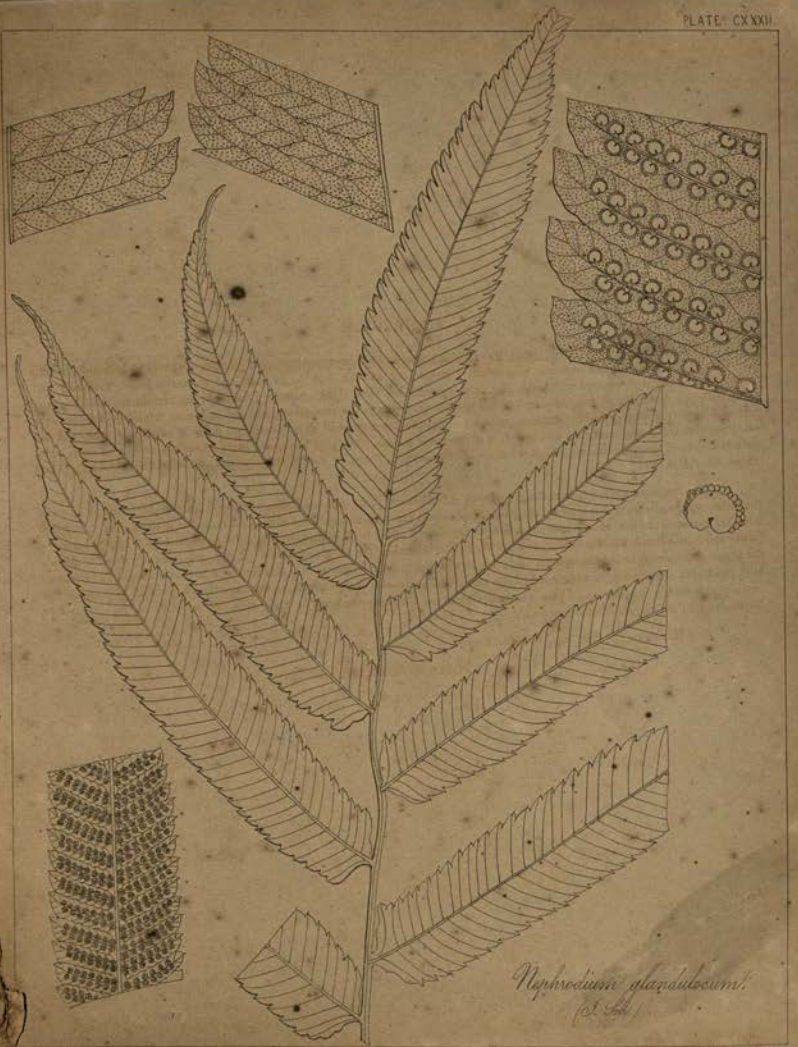
NEPHRODIUM.

NEPHRODIUM GLANDULOSUM. (J. Sm.) Fronds coriaceo-membranaceous pinnate, glabrous on both sides, pinnæ alternate sessile from a broad truncated base about 6 inches long and an inch to an inch and a quarter broad, gradually and rather long acuminated, covered with small glandular tubercles on both sides, coarsely lobato-serrate, serratures falcate acute, veins 9-10 pair generally all anastomosing (except the 2-3 upper pair in the serratures), and the excurrent veinlets joined throughout and forming a very prominent flexuose pseudo costule, the lower pair of veins or one of them is sometimes free, and the excurrent veinlet is also sometimes free in 1 to 4 of the lower areoles, sori large situated a little below the middle of each vein, indusium very apparent reniform ;—Nephrodium ;—*J. Sm. in Hook. Journ. of Bot., p.* 411 ;—Aspidium ;—*Bl. En. Fil. Jav., p.* 144 ? *Hook. Sp. Fil.* iv. 76.

The specimen figured is from the Himalayas, (Mr. Oldham). I am not quite sure whether I have rightly named this and the following species, several species of the genus Nephrodium are very closely allied to each other, and it is impossible to say that intermediate forms do not exist ; both these species are closely allied to N. abruptum *Presl.*, the specimens here figured have the fertile and sterile fronds exactly similar, and Sir W. Hooker describes the N. glandulosum. *J. Sm.* and lineatum *Presl.* as having the fronds dimorphous, or subdimorphous. I do not, however, attach any importance to this fact, as I have often found N. abruptum with the fronds dimorphous, or with broad sterile pinnæ and contracted fertile pinnæ on the same frond, or with both sterile and fertile pinnæ exactly similar, and I have constantly observed the same tendency in many other genera with dimorphous fronds, (Gymnopteris Pœcilopteris, Meniscium, &c.)

Hab. Himalayas, Assam, Java, Island of Leyte.

PLATE No. CXXXII.


Nephrodium glandulosum.
(J. Sm.)

NEPHRODIUM.

NEPHRODIUM LINEATUM. (Presl.) Fronds ovate pinnate, veins on the upper side furnished with a few distant longish hairs, on the under side slightly pubescent or subglabrous, pinnæ alternate sessile or subpetiolate, 5 to 7 inches long by 1 to 1½ broad, shortly and rather suddenly acuminated, covered with minute glandular tubercles on both sides, sub-entire or more or less repando-serrate, terminal pinnæ often lobed towards the base, veins 8 or 10 pair all or all but the upper pair anastomosing and at their junction excurrent, the excurrent veinlet being generally free in the lowest pair, but forming a continuous pseudo costule in all the others, sori small about the middle of each vein, indusium apparent reniform. Nephrodium, *Presl. Epimel. Bot. p.* 48. *Hook. Sp. Fil.* iv. 74 ;—Aspidium obscurum ? *Bl. En. Fil. p.* 150 ?

The specimen figured is from Nynee Tal, (Mr. Oldham). It is almost exactly similar to *Goniopteris urophylla.* (Pl. CCXXXIX) of the "Ferns of Southern India," except that it is always indusioid ; as Sir W. Hooker observes, it is very startling how some ferns of the *Aspidioid* group exactly resemble others of the tribe *Polypodiæ,* the presence or absence of the indusium being almost the only distinction.

PLATE No. CXXXIII.

PLEOCNEMIA. (See " Ferns of Southern India," p. 28.)

PLEOCNEMIA LEUZEANA. (Kze). Stipes 1½ foot long, stout angular crinite at the base with very long subulate flexuose silky scales, fronds large, ample submembranaceous tripinnate, primary pinnæ a foot and more long, ovate acuminate petiolate, pinnules 3-4 inches long, petiolulate from a broad subcordate base, oblong deeply (more than half way down) pinnatifid, ending in a rather long entire acumen, fertile ones often contracted, segments oblong obtuse subfalcate entire crenato-serrate, the basal ones rarely sub-lobato-pinnatifid, veins uniting and forming elongated areoles near the costa, in the sterile more or less united and reticulated at a distance from the costa, sori copious, more or less remote from the margins, involucres orbiculari-cordate readily deciduous. *Hook. Sp. Fil.* iv. 61 ;—Aspidium Leuzeanum, *Kze. Bot. Zeit.* 14-474. *Metten. Fil. Hort. Lips., p.* 94, *t.* 22, *f.* 8-9 ;—Pleocnemia, *Pr. Tent. Pterid., p.* 183. *Epimel. Plant., p.* 50. *Hook. Gen. Fil. t.* 70-*A. (involucres omitted)* and *t.* 97. *J. Sm. in. Hook. Journ. Bot,* iii., *p.* 411. *Brock. Fil. U. S. Expl. Exp. p.* 183 ;—Polypodium *Gaud. in Freyc. Voy., p.* 371. *t.* 6 ;—Pleocnemia Cumingrona *(fertile portions of the frond more contracted.) Pr. Epimel. Bot., p.* 50 ;—Aspidium conjugatum, *Bl. En. Fil. Jav., p.* 169 ;—Pleocnemia conjug., *Pr. Epimel. Bot. p.* 259, *and* P. Javanica, *p.* 50.

The specimen figured is from Birmah—(Parish.)

Hab. Moluccas, Java, Ceram, Luzon, China, Mishmee and Assam, Sylhet, Birmah, Samoan, and Feejee Islands.

PLATE No. CXXXIV.

Reconemia Leuzeana.
(Presl.)

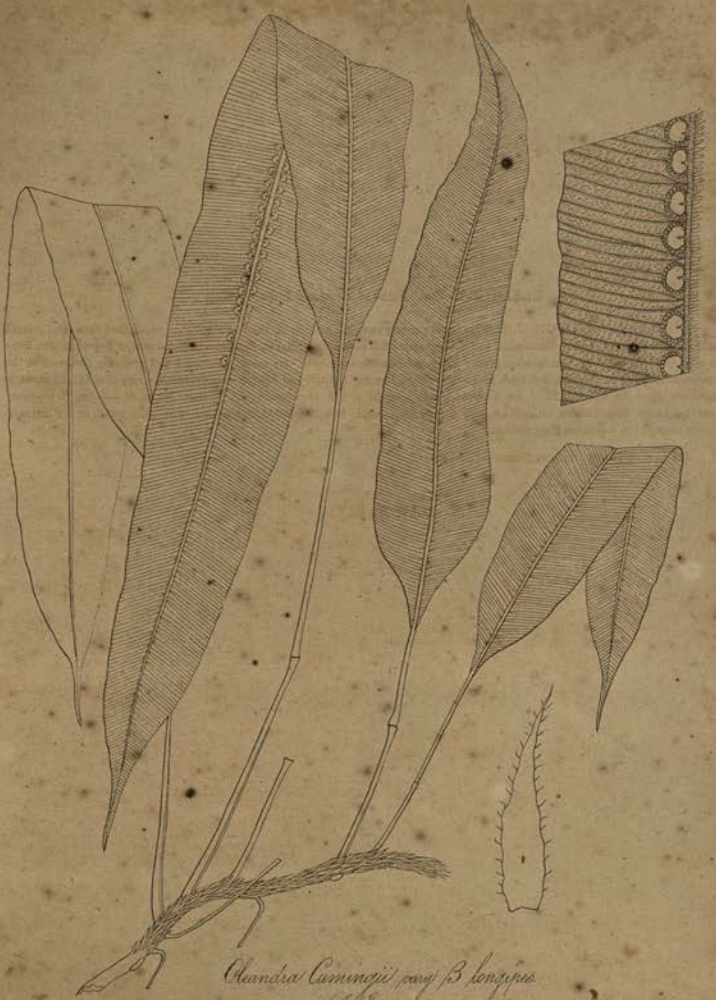
OLEANDRA. (See "Ferns of Southern India," p. 32).

OLEANDRA CUMINGII (*J. Sm.*) Caudex apparently creeping, scarcely so thick as a writing pen, clothed with close pressed subulate imbricated scales, stipites subterminal and subaggregated 2-3 inches long, slightly downy, articulated within $\frac{1}{2}$-$\frac{3}{4}$ of an inch from the base, fronds 1-1$\frac{1}{2}$ foot long, firm membranaceous, elongato-lanceolate acuminate very much attenuated and gradually decurrent at the base, pubescenti-villous on the costa and veins, sori rather large, forming a single and scarcely interrupted line very near to and on each side the costa. *Hook. Sp. Fil.* iv. 158. *J. Sm. in Hook. Journ. Bot.* iii., *p.* 413. (*name only.*) *Pr. Epimel. Bot. p.* 41.——*var. β. longipes;* —stipes 4-6 inches long, inferior articulation 1-2$\frac{1}{4}$ inches long, fronds less attenuated at the base, sori quite costal, in one instance irregularly scattered at a distance from the costa.

The specimen figured is from Birmah—(Parish.)

Hab. Luzon, Birmah, Assam.

PLATE No. CXXXV.



Oleandra Cumingii vary β longipes.
(J. Sm.)

POLYSTICHUM. (See "Ferns of Southern India," p. 41.)

POLYSTICHUM AURICULATUM. (VAR.) SUBBIPINNATUM. (Hook.) Pinnæ subcoriaceous, variously and deeply lobed and toothed, below frequently again pinnated, the lobes and pinnules spinulose (thus bordering on aculeatum var. lobatum.)—*Hook. Sp. Fil.* iv. *p.* 11; Aspidium ocellatum.—*Wall. Cat. n.* 98;—A. lentum, *Don. Syn. Nep. p.* 4.

The specimen figured is from the Khasya Hills, (Dr. Thomson) though differing considerably from the normal state of *P. auriculatum* (Pl. CXX. of the Ferns of Southern India) Sir W. Hooker only considered it a variety of that species.

Hab. Nepaul, Kumaon (elevation 2,600 feet,) Khasya, Harabagh.

PLATE No. CXXXVI.

PLATE CXXXVI

Polystichum auriculatum
var bipinnatum (Hook)

Gyrindo del.

A. Barnes del. & lith. Madras 1865.

SAGENIA. (See "Ferns of Southern India," p. 27.)

SAGENIA SEMIBIPINNATA (Hook.) Caudex creeping scaly, stipites a span to a foot high striated with prominent angles, reddish-brown as well as the rachis and costæ, fronds 1-1½ foot long, oblong-ovate in circumscription coriaceo-membranaceous, dark brown when dry, glabrous sub-bi-tripinnate, pinnæ 9-11 6-10 inches long, linear-lanceolate subflexuose acuminate tapering at the base, quite entire, strongly costate, the lowest pair or two pairs long-petiolate tripartite or 3-foliate, sometimes again divided so as to be twice trifoliate, primary veins sub-horizontal united by arches with the margin, the rest variously anastomosing, the areoles appendiculate, sori (only young and imperfect) compital, involucre subreniform.—*Hook. Sp. Fil.* iv. p. 59. Polypodium semi-bipinnatum.—*Wall. Cat.* n. 388 *and* 2,229.

The figure is taken from Sir W. Hooker's Sp. Fil.

Hab. Penang, Borneo.

PLATE No. CXXXVII.

Sagenia semibipinnatum
(Hook.)

PLEOPELTIS. (See "Ferns of Southern India," p. 57.)

PLEOPELTIS EBENIPES. (Hook.) Caudex stout creeping elongated and knotted with short frondiferous branches, everywhere densely imbricated with intensely-black polished ovato-lanceolate subcoriaceous concave scales fusco-pubescent at the margin, stipites stramineous 6 inches to a span long, fronds a span to 1½ foot long broad-ovate or deltoid cordate at the base, acuminated (by the long terminal segment) coriaceo-membranaceous subrufescent when dry, minutely and compactly pellucido-punctate deeply pinnatifid with acute or obtuse sinuses, segments 4-5 inches long, ¾-1 inch wide, very patent from a broad base oblong-lanceolate sharply acuminate, closely serrated, lowest pair generally opposite and drawn in as it were at the very base so as to form a more or less deep sinus at the summit of the stipes, venation very manifest, costules distinct parallel moderately distant extending to the margin, these are united by transverse veins forming about 3-4 series of areoles including free and connected veinlets of which the second only are soriferous, sori very large orbicular in a single series very near the costa.—*Hook. Sp. Fil.* iv. *p.* 88. Polypodium melanopus.—*Br. in Wall. Cat. n.* 293 *in part (v. Cat. n.* 293 *at p.* 83, *not P. melanopus Hook. and Grev.)*

The specimen figured is from Sikkim, (Dr. Thomson.)

Hab. Nepaul (10,000 feet elevation), N. W. Himalaya (8—9,000 feet elevation), Sikkim (8,000 feet.)

PLATE No. CXXXVIII.

Plecopeltis ebenipes (Hook.)

§ 10—*Meniscieæ.*

(b.) *Veins arcuately anastomosing, forming costal arcoles; venules free.*

BRAINEA. *J. Smith Catalogue of Kew. Ferns.* 1856, v.

(Bowringia, *Hook. non Champion.*)

Gen. char. *Sori* non-indusiate, short, transverse, curved; the *receptacles* seated on the arcuate costal veins, and often extending more or less up the parallel oblique free venules; at length irregularly confluent. *Veins* arcuately anastomosing at the base, forming costal arcoles; *venules* simple or forked, parallel, connivent with the thickened margin;

Fronds rigid coriaceous pinnate, becoming pinnato-pinnatifid. Rhizome arborescent 3-4 feet high. (*Moore.*)

BRAINEA INSIGNIS. (Hook.) Caudex arborescent as thick as a man's arm clothed with shaggy dark-brown or ferruginous long subulato-lanceolate scales, stipites stout, short, scarcely a span long: fronds not unlike a Lomaria firm coriaceous, bright-green, pinnated or below bipinnated, pinnæ very close placed, horizontal 5-6 inches long, 4 lines broad, from a cordate base, linear-oblong, gradually and finely acuminated, minutely serrated.—*Hook. Sp. Fil.* v. 162. Bowringia, *Hook. Kew. Gard. Misc.* v. *p.* 23 *t.* 2.—*Hook. Fil. Exot. t.* 38.

The specimen figured is from Burmah, (the Pine Forests,) [Parish.]

Hab. Hongkong, Eastern Bengal, Khasya (elevation 4,000 feet.), Burmah.

PLATE No. CXXXIX.

PLATE CXXXIX.

Brainea insignia (J. Sm.)

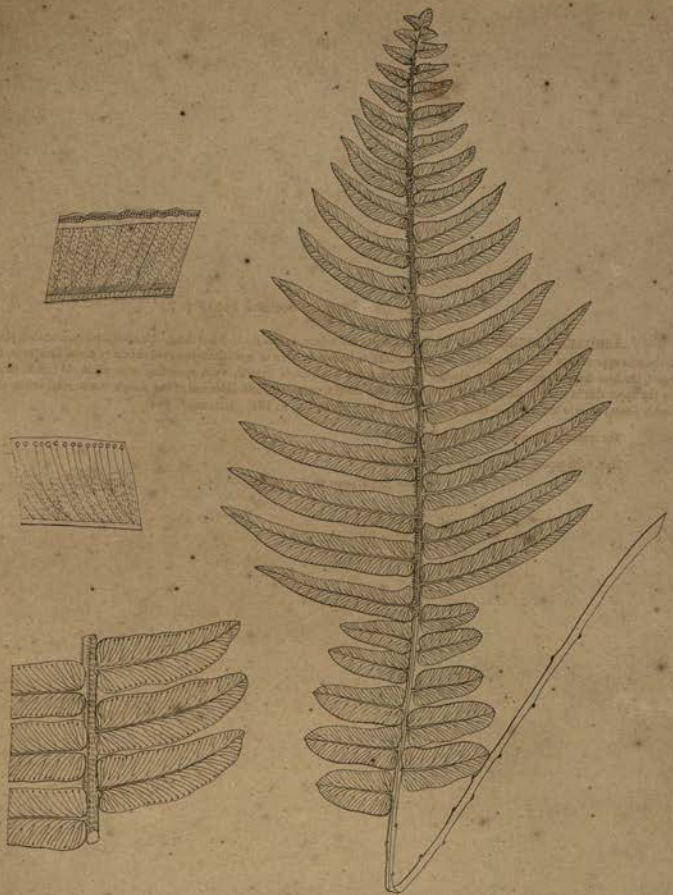
LINDSÆA. (See "Ferns of Southern India," p. 7.)

LINDSÆA LANUGINOSA. (J. Sm.) Caudex tall robust, fronds up to 3 feet long, oblong-lanceolate pinnated, pinnæ subcoriaceous approximate very numerous oblong approaching to lanceolate more or less falcate-incurved obtuse or acute, deciduous, the sides equal, the base truncate sessile, below clothed with deciduous wool, costâ central, veins spreading copious, in old fronds terminating on the upper side in white cretaceous dots just within the margin, sorus on both sides and at the margin continuous, stipes short and rachis (stout) more or less woolly.—*Hook. Sp. Fil.* i. *p.* 210.; *Wall. Cat. n.* 154. Isoloma, *J. Sm.*

The specimen figured is from Burmah, (Parish.)

Hab. Singapore, Penang, New Guinea, Burmah.

PLATE No. CXL.



Lindsæa lanuginosa (Wall)

A. Garrow lith. Madras

SCHIZOLOMA. (See "Ferns of Southern India," p. 9.)

SCHIZOLOMA DAVALLIOIDES. (Bl.) Caudex creeping, stipes and rachis long tetragonous glabrous, stipites tufted, frond subdeltoid-ovate bipinnate, pinnæ erecto-patent lanceolate acuminate, pinnules dimidiato-oblique membranaceous reticulated (reticulations few), the apex obtuse, superior base truncate, costa at the inferior margin, superior margin rather deeply but irregularly lobed, sori interrupted linear confined to the apices of the lobes.—*Hook. Sp. Fil.* i. 224 ; *Bl. Fil. Jav. p.* 218. Lindsæa lobata, *Wall. Cat n.* 152. Davallia Kunziana.—*Hook. Sp. Fil.* i. 177.

The figure is taken from Sir W. Hooker's Sp. Fil.

Hab. Singapore, Java, Malacca.

PLATE No. CXLI.

PLATE CXLI.

Schizoloma davallioides.
(Bl.)

CHEILANTHES. (See "Ferns of Southern India," p. 63.)

CHEILANTHES SUBVILLOSA. (Hook.) Stipes shining brown slightly scaly, frond broad-lanceolate or ovate pinnate, thin sub-membranaceous glabrous above, soft villous about the rachises beneath, pinnæ all obtuse, upper ones lanceolate, the rest broad deltoid-lanceolate or ovate pinnatifid, rarely the lowest laciniæ again pinnatifid, the margin nearly entire, involucres of nearly the same color and texture as the frond, sometimes subrotund and free, mostly continuous, lobed and crenated, main rachis especially above villous. *Hook. Sp. Fil.* i. *p.* 87.

The figure is taken from Sir W. Hooker's *Sp.* Fil.

Hab. Western Himalaya.

PLATE No. CXLII.

Cheilanthes subvillosa
(Hook.)

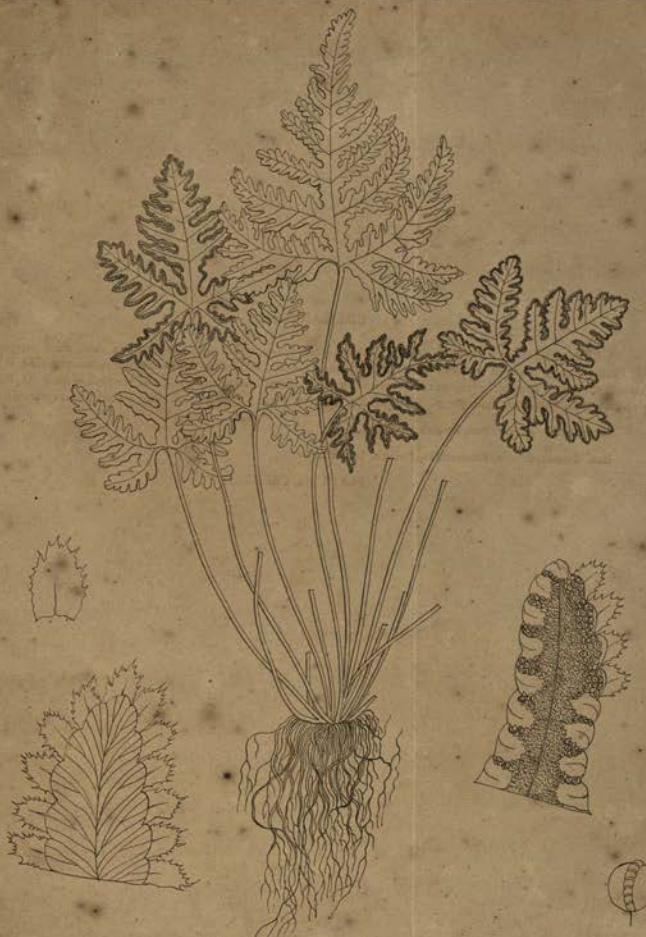
CHEILANTHES.

CHEILANTHES ARGENTEA. (Hook.) Glabrous glossy brown, a little scaly below, caudex short, thick, creeping, stipites tufted, frond cordately 3 angled tripartite white and pulverulent beneath, each of the three primary divisions pinnatifid, at their base bipinnatifid, the margin crenated, involucres membranaceous brown confluent transversely waved and crenated.—*Hook. Sp. Fil.* 1 *p.* 76. Pteris argentea, *Gmel. in Nova. Acta. Petrop.* xii. *t.* 12 *f.* 2; Allosorus, *Presl.*; Cassebeera, *J. Sm.*;—Pteris pedata, var. *Linn.*

The specimen figured is from Burmah, (Pariah.)

Hab. Burmah, Siberia, Kamtschatka, Dahuria, Lake Baikal.

PLATE No. CXLIII.



Cheilanthes argentea
(Kunth)

CHEILANTHES.

CHEILANTHES RUFA. (Don.) Roots tufted, stipites rather short with few spreading scales and shaggy as is the whole rachis with very copious spreading ferruginous hairs, fronds about a span long ovato-lanceolate subcoriaceous hirsuto-pubescent above, white and pulverulent beneath, the margin densely ferrugineo-hirsute, pinnate, pinnatifid at the apex, pinnæ oblong very obtuse pinnatifid, the lower ones subovate sub-bipinnatifid, involucres dark-brown membranaceous approximate and free or continuous and waved and crisped or lobed and toothed at the margin, often quite concealed by the copious ferruginous tomentose shaggy hairs.—*Hook. Sp. Fil.* i. *p.* 79.;—*Don. Prod. Fl. Nep. p.* 18. Cheilanthes farinosa *var.* vestita.—*Wall. Cat. n.* 71 (4.)

The specimen figured is from Burmah, (Parish.)

Hab. Nepaul, Mergui, Mishmee, Burmah, Khasya, Simla.

PLATE No. CXLIV.

Cheilanthes rufa. (Don.)

CHEILANTHES.

CHEILANTHES SZOVITZII (Fisch. et Mey.) Roots densely tufted from a short thick caudex, stipites crowded 2-4 inches long, slender and as well as the principal rachises ebeneous somewhat hairy mixed with copious long spreading subulate scales, fronds 3-4 inches long oblong-lanceolate, quite glabrous above, densely woolly and generally tawny beneath, tri-subquadripinnate, primary pinnæ ovate acuminate approximate or distant, pinnules small subrotund or subcordate, sublobate, terminal ones often larger and oblong, the margin revolute forming nearly a continuous involucre, the edges obscurely membranaceous.—*Hook. Sp. Fil.* i. *p.* 98; *Fisch. et Mey. in Hohenacker En. Pl. Prov. Talysch., p.* 11.

The figure is taken from Sir W. Hooker's Sp. Fil.

Hab. Caucasian Alps, Affghanistan, Peshawur, Indus Valley (7,500 feet elevation), Kashmir, and Western Thibet (8,500 feet elevation), Scinde.

PLATE No. CXLV.

Cheilanthes Szovitzii.
(Fisch. et Mey.)

A. Barnes, lith. Madras.

ASPLENIUM. (See "Ferns of Southern India," p. 42.)

ASPLENIUM FONTANUM. (Bernh.) Caudex short thick tuberous densely rooting, stipites 1-3 inches in length slender, pale brownish-green densely tufted, fronds 3-6 inches long linear or broad-lanceolate attenuated below, membranaceous, bright green, bipinnate, pinnæ approximate ¼ to ½ an inch long, patent or sometimes reflexed, sessile, ovate obtuse, lowest ones dwarfed tripartite, pinnules obovate or cuneate minute ½ a line to a line long the base entire, the rest coarsely and spinuloso-dentate, sori few on each pinnule or lobe at length confluent, involucres very small, athyroid white thin membranaceous.—*Hook. Sp. Fil.* iii. *p.* 193 ;—*Bernhard in Schrad, New. Journ.* 1806 i. *part* 2, *p.* 26 ;—*Sw. Syn. Fil. p.* 57 ;—*Willd. Sp. Pl.* v. *p.* 272 ;—*Engl. Bot. t.* 2,024 ;—*Mett. Asp. p.* 140 ; Athyrium *Roth.* ;—Asplenium Halleri. *Willd. Sp. Pl.* v. *p.* 274.

The specimen figured is from the Himalayas, (Dr. Stewart.)

Hab. Europe, Britain, Himalayas.

PLATE No. CXLVI.

Asplenium fontanum
(Bernh.)

ASPLENIUM.

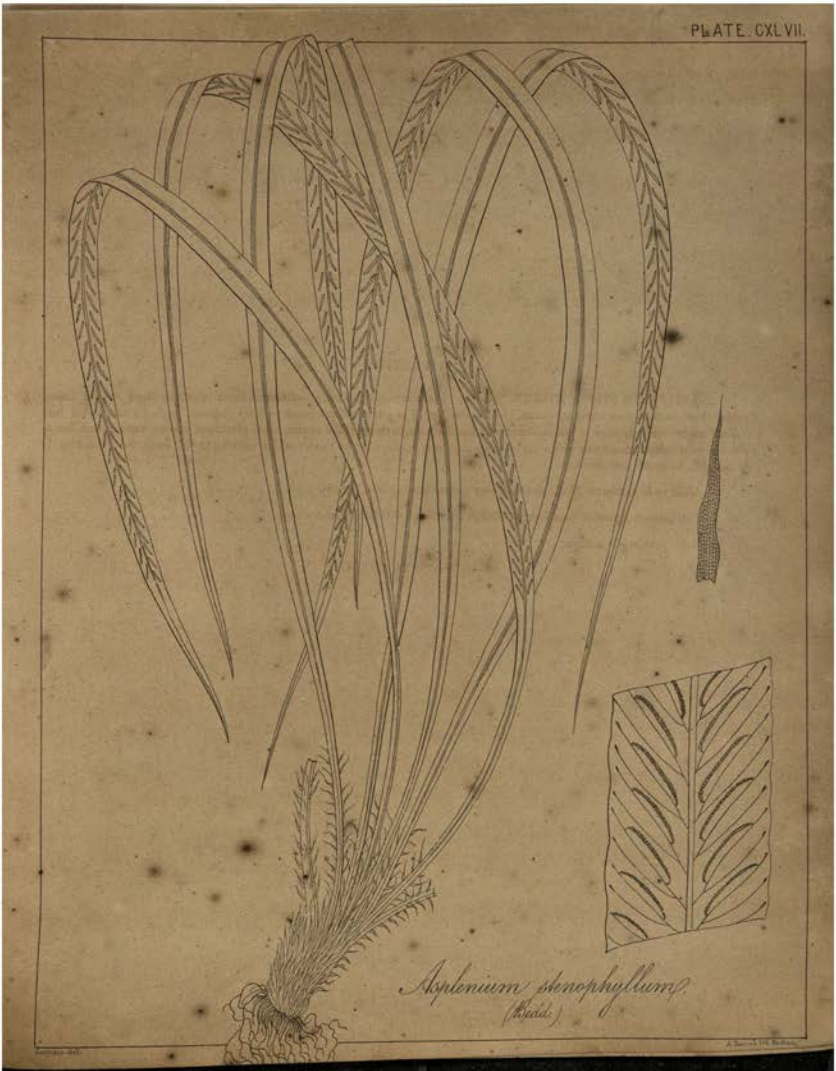
ASPLENIUM STENOPHYLLUM. (Bedd.) Caudex creeping, densely clothed with linear acuminate black smooth scales, fronds subcoriaceous, narrow-linear acuminate, 15-18 inches long, ¼ to ⅜th of an inch broad perfectly glabrous gradually attenuated into a short stipes which is more or less furnished with scales similar to those on the caudex, costa prominent sulcate, veins sunken inconspicuous, once forked, terminating within the margin ; sori linear on the superior veinlet neither reaching to the costa nor extending to the margin ; involucres conspicuous.

Allied to A. ensiforme (Wall.) but with very narrow fronds like a Vittaria.

The specimen figured is from Rungro, Sikkim (elevation 6,000 feet), (Dr. Anderson.)

Hab. Sikkim—Himalaya.

PLATE No. CXLVII.



Asplenium stenophyllum.
(Bidd.)

GRAMMITIS. (See "Ferns of Southern India," p. 17.)

GRAMMITIS MICROPHYLLA. (Hook.) Caudex very slender filiform subrepent and intertwined so as to form a collection of tufted wiry fibres, stipites copious slender filiform very fragile dark-purple ebeneous glossy 2-4 inches long, fronds membranaceous sub-diaphanous 1½-2½ inches long glabrous triangulari-ovate 3-pinnate (or pinnate and 2-3 pinnatifid) lowest primary pinnæ half-ovate the rest oblong, ultimate pinnules (or segments) oval-lanceolate entire acute decurrent upon the rachises which thus become winged, veins dichotomous one in each pinnule or segment oblong not forked, veinlets terminating below the apex.—*Hook. Sp. Fil.*, v. *p.* 129; *Ic. Pl. t.* 1916; *Cent. of Ferns t.* 16.

The specimen figured is from the Khasya Hills.

Hab. Khasya Hills.

PLATE No. CXLVIII.

Grammitis microphylla
(Hook.f.)

§13. GYMNOGRAMMEÆ.

(c.) *Veins connivently anastomising below.*

STEGNOGRAMMA. *Bl. En. Fil. Java.* 172.

(Syneuron, J. Sm. M. S.—Gymnogrammitis, Sp. Bl.—Phegopteridis, Sp. Mettenius.)

Gen. char. *Sori* non-indusiate, linear or oblong, oblique, parallel; the *receptacles* simple elongated and medial. *Veins* simple from a central costa; the lower or more opposite pairs angularly connivent-anastomising.

Fronds herbaceous pinnate or pinnato-pinnatifid. Rhizome thickish decumbent or erect and sub-arborescent. This is amongst Gymnogrammeæ what Nephrodium is amongst Aspidieæ and Goniopteris among Polypodieæ. (Moore.)

STEGNOGRAMMA ASPIDIOIDES. (Bl.) Caudex ascending more or less paleaceous-subrepent, *whole* plant on both sides especially on the veins hairy (except the caudex) sometimes densely villous, stipites terminal on the caudex tufted a span to a foot long at length glabrous glossy, fronds 1-1½ foot long 5-6 inches wide ovate-lanceolate acuminate pinnated, pinnatifid at the apex, firm-membranaceous, pinnæ opposite or alternate sessile subtruncate or more or less adnate at the base 3-4 inches long rarely an inch wide oblongo-lanceolate lobato-pinnatifid, superior ones confluent, veins 5-6 pairs from each costule simple 3 lower ones united to those opposite and forming an excurrent spurious vein reaching to the sinus, those in the lobes free, all soriferous, sori linear-oblong occupying nearly the whole length of the veins.—*Hook. Sp. Fil.* v. 150.—*Bl. En. Fil. Jav. p.* 172, (*not Fil. Jav. p.* 112, *which is* Gymnogrammæ totta) Gymnogramme Stegnogramme, *Bl. Fil. Jav. p.* 98 *t.* 44. Phegopteris Stegnogramme, *Metten. Fil. Hort. Lips. p.* 84.

The specimen figured is from Khasya, (Dr. Thomson.)

Hab. Java, (3-4,000 feet elevation), Khasya (6,000 feet elevation), Ceylon, (vide p. 78 "Ferns of Southern India and Ceylon.")

PLATE No. CXLIX.

PLATE CXLIX

Stegnogramma aspidioides.
(Bl.)

Govindoo del.

A Barron Lithog. Madras 1896

§ 13. GYMNOGRAMMEÆ.

(d.) Veins pinnate: venules reticulated with free included veinlets.

SELLIGUCA. *Bory. Dict. Class. d'Hist. Nat.* vi. 587.

(Diagramma, *Blume*;—Colysis *Presl.*;—Dictyogramma *Presl.*;—Grammitidis Sp. *Auct.*; Gymnogrammatis Sp. *Auct.*;—Hemionitidis Sp. *Auct.*;—Polypodii Sp. *Auct.*;—Ceterachis Sp. *Auct.*)

Gen. char. *Sori* non-indusiate, oblong or linear, oblique; the elongate *receptacles* lying between and parallel with the primary veins. *Veins* pinnate or sub-pinnate from a central costa; *Venules* compoundly anastomosing, producing within the areoles variously directed free curved *veinlets*.

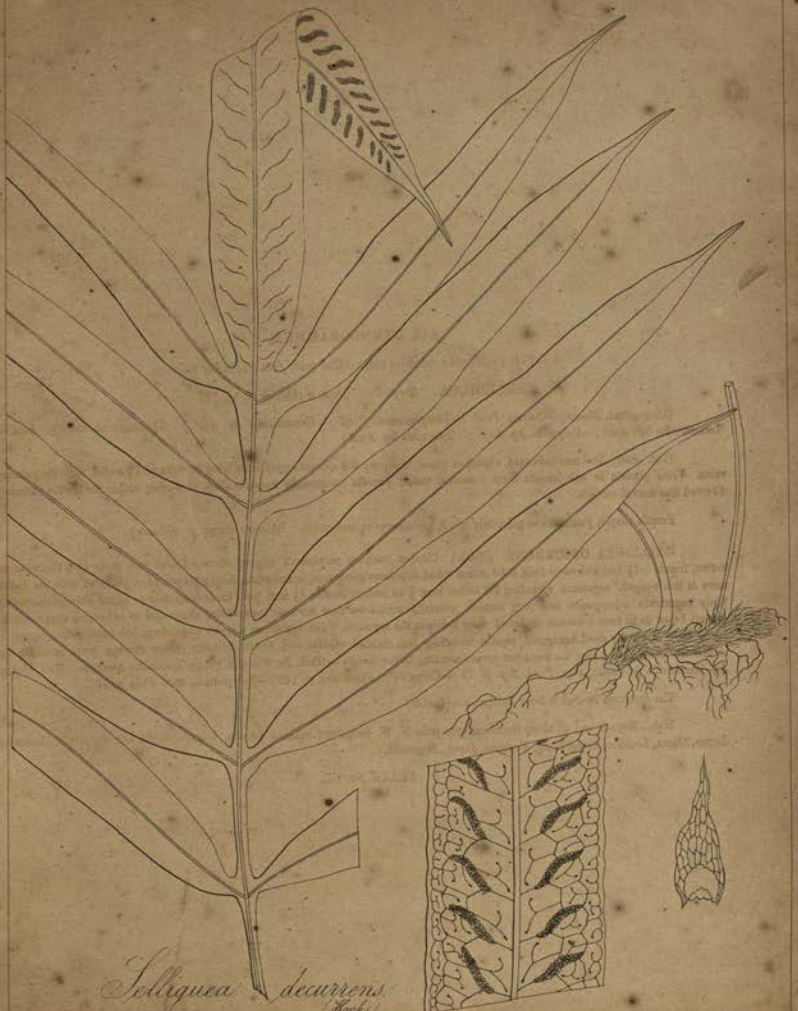
Fronds simple, pinnatifid or palmately-lobed, herbaceous or coriaceous. Rhizome creeping. (Moore.)

SELLIGUEA DECURRENS. (Hook.) Caudex creeping paleaceous, stipites distant 1 foot and more long straminecous-brown, fronds 1-1½ foot and more long 8-10 inches broad firm-membranaceous, broad-ovate, deeply pinnatifid or pinnated with the rachis more or less winged, segments spreading 6-8 inches long ½ an inch or less to 1½ inch wide linear-lanceolate or broad oblongo-lanceolate finely acuminate subopposite and very distant, generally contracted near the base then dilated above, and so extending above and decurrent below as to form a narrow or broad wing between the segments, veins sometimes slightly costuliform but usually they constitute rather large unequally-sized hexagonal areoles including free clubbed veinlets, sori linear obliquely patent varying much in length and in breadth, commencing near the costa but never extending to the margin.—*Hook. Sp. Fil.* v. p. 161;—Grammitis decurrens, *Wall. Cat. n.* 5.—Hemionitis pothifolia, *Don. Prod. Nep. p.* 13;—Colysis *Pr. Epim. Bot. p.* 148;—Polypodium, *Mett. Poly. p.* 103.

The specimen figured is from Moulmein—(Parish.)

Hab. Nepaul, and all along the Himalayas from N. W. Bengal to Sikkim, Bhotan, Khasya (6,000 feet elevation), Moulmein, Luzon, China, Loochoo, Hong-Kong, Formosa, Japan, Nagasaki.

PLATE No. CL.



Selliguea decurrens.
(Hook.)

Govindoo del.

A. Barron Lithog. Madras 1858

SELLIGUEA.

SELLIGUEA FEEI. (Bory.) Caudex creeping paleaceous with subulato-setaceous scales which are dilated at the base stipites distant 2-4 or 6 inches long (of the fertile fronds) fronds more or less firm-coriaceous glabrous; sterile ones 2-4-5 inches long, ovate acuminate with an obtusely cuneate base rarely and only when young oblongo-ovate and obtuse; fertile ones 4-6 inches long lanceolate acuminate (rarely oblong and obtuse) sub-decurrently attenuated at the base, costules very prominent especially in the fertile fronds, veins obscure, in the sterile fronds forming a net work of irregular areoles in which are included free clavate simple or forked veinlets, in the fertile fronds less compound and veinlets not forked, sori central between, and parallel with the costules, sunk, when young, small and suborbicular, in maturity nearly as long as the costules linear-oblong pulvinate rarely subinterrupted.—*Hook. Sp. Fil.* v. 158; *Bl. Fil. Jav. p.* 123 *t.* 51; *Bory. in Dict. Class d'Hist. Nat.* vi. *p.* 344;—Polypodium Vulcanicum; *Bl. l. c. p.* 144*t.* 56. *Fig.* 2;—Grammitis diversifolia. *Wall. Cat. n.* 8.

The Specimen figured is from the Calcutta Herbarium.

Hab. Penang, Singapore, Java, Borneo.

PLATE No. CLI.

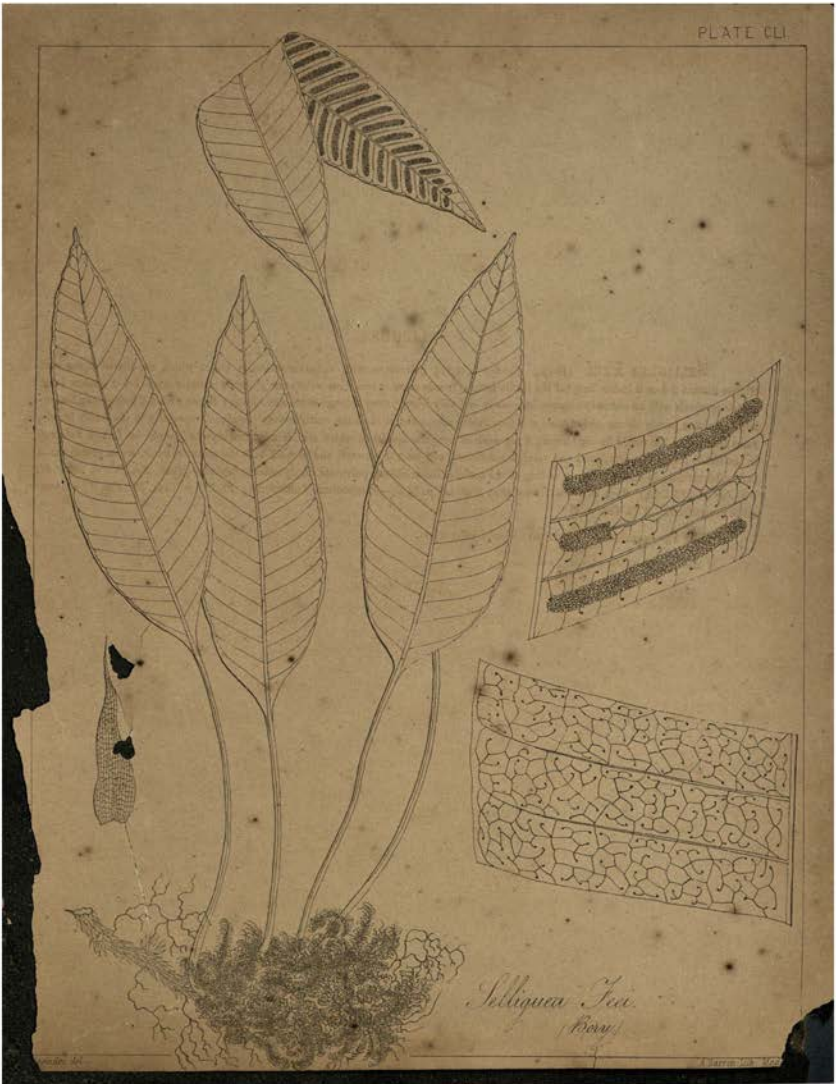


PLATE CLI.
Selliquea Feei.
(Bory)

GRAMMITIS. (See "Ferns of Southern India," p. 17.)

GRAMMITIS AURITA. (Hook.) Caudex creeping elongated paleaceous, stipites a span to a foot long, dark, castaneous glossy, fronds 1½-2 feet long firm membranaceous ovato-oblong acuminate pinnate rarely sub-bipinnate, pinnæ mostly opposite in distant pairs approximate (confluent at the apex) 4-8 and more inches long, ½-1 inch wide from a broad sessile base (1½-2 inches wide) oblong gradually acuminated deeply pinnatifid, lobes broader at the base oblongo-acuminate crenato-serrate the lowest pair twice longer and larger, especially the inferior one and sub-pinnatifid, veins simple or forked all soriferous, sori oblong simple rather nearer the margin than the costule.—*Hook. Ic. Pl. t.* 974, *or* 74, *Cent. of Ferns. Sp. Fil.* v. *p.* 141.—Phegopteris of *J. Sm.*

The specimen figured is from the Khasya Hills, (Blandford.)

Hab. Khasya, Mumbree and Muncklow, Lachen, (alt. 6,000 feet.)

PLATE No. CLII.

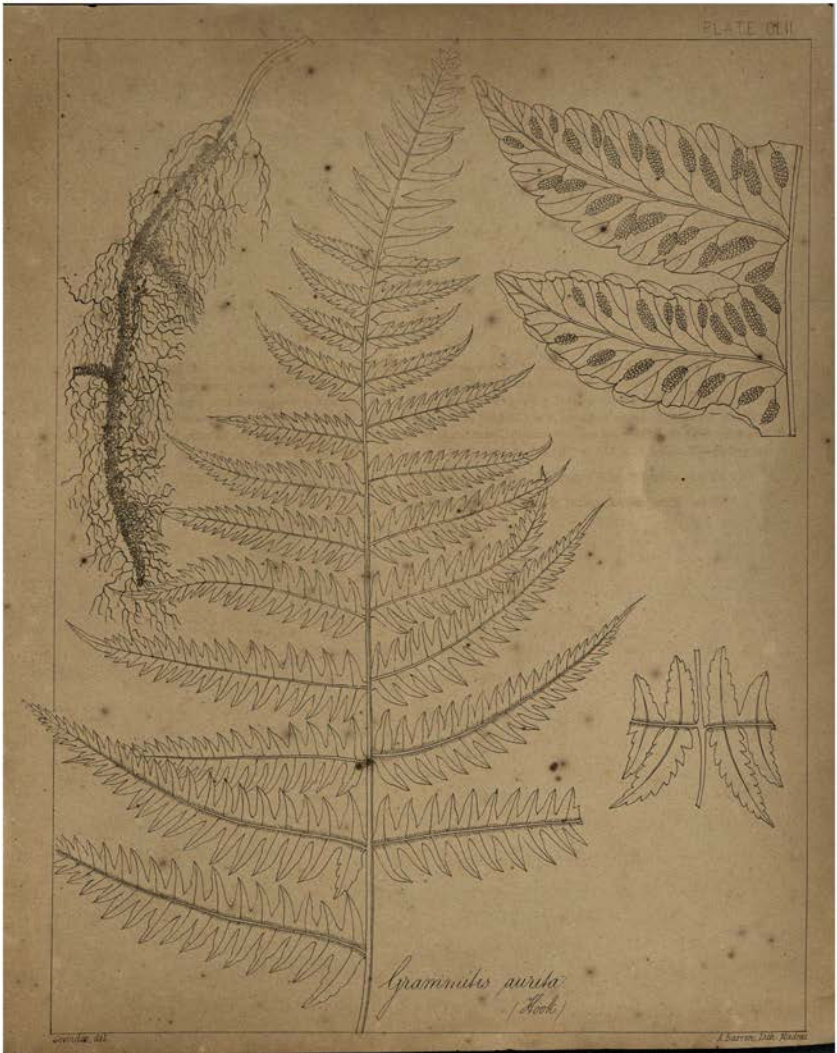


PLATE CLII
Grammitis aurita
(Hook)
Sowerby del.
A. Barron, Lith. Madras

§12. HEMIONITIDEÆ.

(b.) Primary veins parallel forked, venules sparingly reticulated towards the margin.

SYNGRAMMA. *J. Sm. Hook. Lond. Jour. Bot.* iv. 168, *t.* 7. 8.

(Callogramma. *Fée.*;—Gymnogrammatis *Sp. Auct.*;—Diplazii *Sp. Presl.*;—Oxygonii *Sp. Auct.*;—Callipteridis *Sp. J. Sm.*;—Grammitidis, *Sp. Wallich.*)

Gen. char. *Sori* non-indusiate superficial, narrow linear, sub-parallel, unequally anastomosed, *i. e.*, the lines more or less but sparingly united, sometimes only at the ends; the *receptacles* thus reticulated. *Veins* simple or forked from a central costa, parallel below forming elongate oblique areoles, more closely reticulated near the margin forming one or two series of shorter areoles, the ultimate veinlets sometimes free.

Fronds simple or pinnate sub-membranaceous. Rhizome short erect or creeping—(*Moore.*)

SYNGRAMMA WALLICHII. (Hook.) Caudex creeping underground, stipites subfasciculate a span to 1½ foot long black, purple, fronds subcoriaceo-membranaceous simple 6-10 inches long 1½-2 inches wide in the middle broad-lanceolate or subelliptico-acuminated entire narrow cuneato-attenuate at the base, veins numerous approximate simple or forked anastomosing only at the margin into 1-2 rarely more series of a oblong hexagonal areoles, sori narrow-linear on all the straight veins, but scarcely extending to the anastomosing ones.—*Hook. Sp. Fil.* v. 155.

The figure is taken from Sir W. Hooker's Sp. Fil.

Hab. Singapore, Borneo, Sarawak, and Labuan.

PLATE No. CLIII.

Syngramma Wallichii Hook.

SYNGRAMMA.

SYNGRAMMA VESTITA. (Moore.) Caudex ? base of stipes clothed with golden scales, stipes 2-4 inches long, fronds 6-12 inches long 1-1½ inch broad, everywhere as well as the rachis and stipes velvetty with long sericeous golden hairs, most copious beneath, subcoriaceo-membranaceous, pinnated to the apex alternate 7-14 on each side ½ to one inch long, petiolate oblongo-ovate obtuse entire often with an auricle at the superior base, veins simple forked or pinnate where pinnate the lower venules anastomose and form elongated costal areoles, sori universal on the veins. Grammitis ? *Wall.*—Gymnogramme (Eugymnogramme) vestita. *Hook. Sp. Fil.* v. 143 ?

The specimen figured is from N. W. Himalaya, (Hook. Fil. and Thomson.)

Hab. N. W. Himalaya, 5-8,000 feet elevation.

PLATE No. CLIV.

Syngramma vestita.
(Moore)

Lowndes del. A. Barnes Lith. Madras

§12. HEMIONITIDEÆ.

(a.) *Veins pinnate: venules reticulated.*

DICTYOCLINE. *Moore. Gard. Chron.* 1855. 854.

Gen. char. *Sori* non-indusiate, narrow-linear, superficial on the anastomosing venules, the *receptacles* therefore reticulated. *Veins* pinnate from a central costa; venules transversely anastomosing forming 2 or 3 series of roundish-hexagonal areoles between the primary veins.

Fronds coarse herbaceous pinnate with 3-4 pairs of pinnæ very hairy. Sori reticulated between the primary veins. Rhizome short thick decumbent. (*Moore.*)

This genus differs from Hemionitis in having pinnate venation, and in the sori only occurring on the venules.

DICTYOCLINE GRIFFITHII. (Hook. Fil. et Thomson.) Caudex ? stipites 8-12 inches long villous paleaceous at the base with subulate scales, fronds coriaceo-membranaceous, villous especially on the venation 8-10-14 inches long 6-8 inches broad cordato-ovate acuminate pinnatifid or oblong or broad-ovate and pinnated, pinnæ about nine, 6 inches long by 1-1½ inch wide petiolate oblong subfalcate acuminate entire rotundato-cuneate at the base, terminal pinnæ large-petiolate acuminately pinnatifid, its lowest pair of segments much the longest, the basal pair of pinnæ the largest broad oblong falcate and acuminate more or less lobed the rest gradually smaller upwards, the apex acuminated entire, pinnæ and larger segments costate with the costæ pinnated the rest of the venation reticulated, costal areoles the largest.—Var. α. pinnata Hemionitis Griffithii. *Hook. Fil. et Thom.*;—Var. β. pinnatifida. Hemionitis Wilfordii. *Hook. Fil. Ewot. t.* 93. *Hook. Sp. Fil.* v. 193.

The specimen figured is from Khasya (Hook. Fil. and Thom.)

Hab. Khasya, Formosa.

PLATE No. CLV.

PLATE CLV
Dictyocline Griffithii
(Hook. fil. et Thom.)
Fernandez del.
A. Darren Lith. Madras

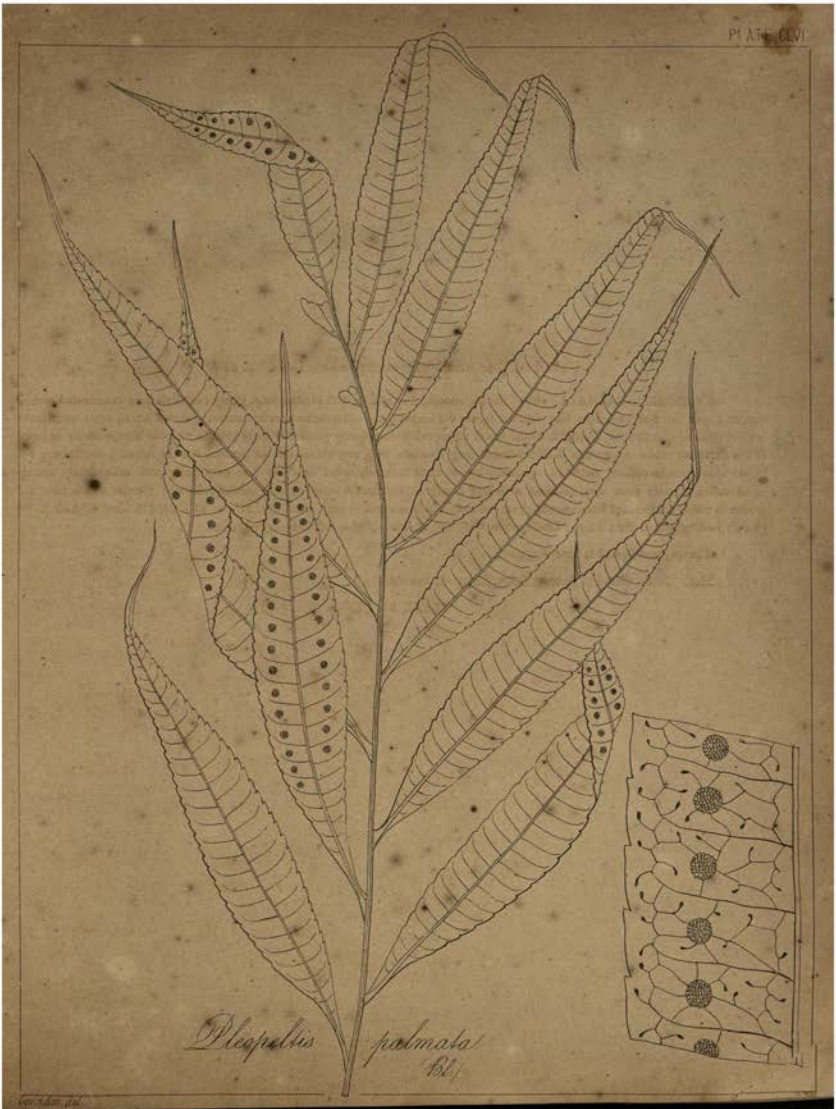
PLEOPELTIS. (See "Ferns of Southern India," p. 57.)

PLEOPELTIS PALMATA (Bl.) Caudex creeping ferruginous with copious large glossy lanceolate long acuminated scales, stipites a span to a foot and more long slender, fronds 6-8 inches long subcoriaceo-membranaceous glabrous broad-ovate acuminate cuneate attenuated at the base deeply pinnatifid or not unfrequently decurrently pinnate or truly pinnate with the always sessile or more or less decurrent pinnæ or segments 3-12 5-6 inches long alternate with very obtuse sinuses terminal one the largest; sterile ones 1-2 inches wide broad lanceolate; fertile ones generally longer, all of them contracted near the base very finely and subcordately acuminated entire, pinnate veins very manifest extending nearly to the margin united by very slender indistinct venules which form 3-4 areoles in which are included free incurved clavate veinlets, sori in a single series. *Hook. Sp. Fil.* v. 89; *Bl. Fil. Jav. p.* 150 *t.* 64 (*not Pr.*)—Drynaria *J. Sm.*; Ployp: Lindleyanum *Wall. Cat. n.* 304. Phymatodes Meyeniana. *Presl.*

The specimen figured is from Singapore.

Hab. Java. Island of Ternate, Luzon, Singapore, Penang.

PLATE No. CLVI.


Pleopeltis palmata
Bl.

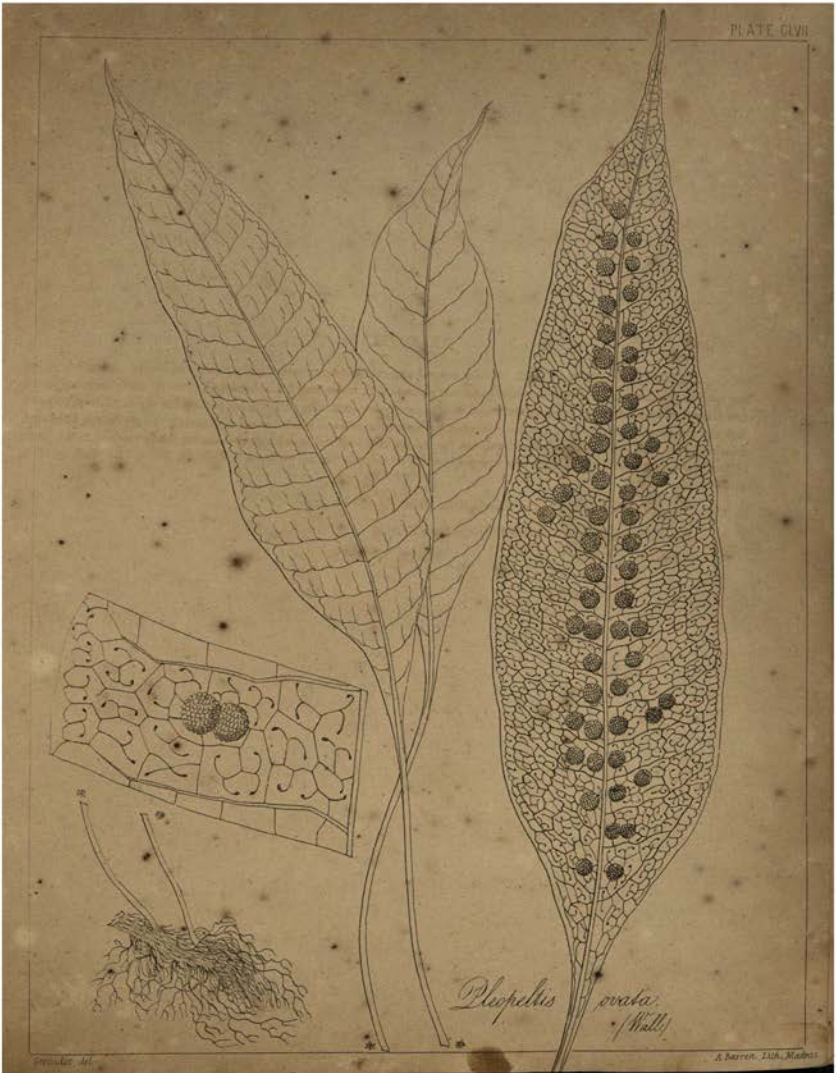
PLÆOPELTIS.

PLEOPELTIS OVATA. (Wall.) Caudex creeping apparently under-ground slightly paleaceous, stipites distant 3-8 inches long sparsely paleaceous below, fronds firm-membranaceous glabrous 5-11 inches long 2-3 inches broad, ovate or ovato-lanceolate acuminate entire the broad base rather suddenly attenuated so as to form a decurrent wing on the upper part of the stipes, costules very evident slightly prominent straight or flexuose connected by transverse veins on which the sori are inserted, the areoles are filled with reticulated veins with or without free included veinlets, the sori are very large and prominent when mature chiefly confined to the centre of the frond distant from the margin scarcely arranged in series, occasionally two are confluent. *Hook. Sp. Fil.* v. 64 ; *Wall. in Hook. and Grev. Ic. Fil. t.* 41.

The specimen figured is from the Khasya Hills, (Hook Fil. and Thomson.)

Hab. Khasya, Bhootan, Sikkim—Himalaya, Nepal.

PLATE No. CLVII.


Pleopeltis ovata.
(Wall.)
A. Barren. Lith. Madras

PLEOPELTIS.

PLEOPELTIS GRIFFITHIANA. (Hook.) Caudex long creeping paleaceous with long subulate ferruginous scales, stipites very remote 3-6 inches long, fronds chartaceo-coriaceous glabrous 6-8 inches long 1½-2 inches broad oblongo or ovato-lanceolate entire or obsoletely crenate, acuminate, cuneate at the base sometimes glaucous beneath, the margin thickened, costules very distinct straight prominent beneath, the rest of venation less distinct more or less anastomosing with copious free veinlets in the areoles, sori very large globose compital forming a single series on each side of and close to the costa.—*Hook. Sp. Fil.* v. 62 ; *Cent. of Ferns t.* 51 *and Ic. Pl. t.* 951.

The specimen figured is from Khasya, (Hook. Fil. and Thomson.)

Hab. Bhootan, Mishmee, Khasya.

PLATE No. CLVIII.

Pleopeltis
Griffithiana
(Hook.)

PLEOPELTIS.

PLEOPELTIS ROSTRATA. (Hook.) Caudex very long filiform creeping branched setaceous with very slender subulate scales, stipites remote 1-2 inches long, fronds scarcely dimorphous from 2-4½ inches long ½ an inch to an inch wide coriaceo-membranaceous opaque glabrous lanceolate or elliptical or ovato-lanceolate rather suddenly subrostrato-acuminate ; sterile ones often the shortest and most obtuse, venation internal obscure, veins copiously reticulated, areoles mostly oblong angular obliquely directed from the costa (no costules) each including one simple or branched veinlet sori very large in a single series on each side and near to the costa occupying the upper half of the frond or nearly the whole length. *Hook. Sp. Fil.* v. 66 ; *Cent of Ferns* t. 53, *or Ic. Pl. t.* 953.

The specimen figured is from Khasya, (Hook. Fil. and Thomson.)

Hab. Eastern Himalaya, Khasya, Mishmee, Bhootan.

PLATE No. CLIX.

Pleopeltis prostrata
Hook.

DRYNARIA. (See "Ferns of Southern India," p. 63.)

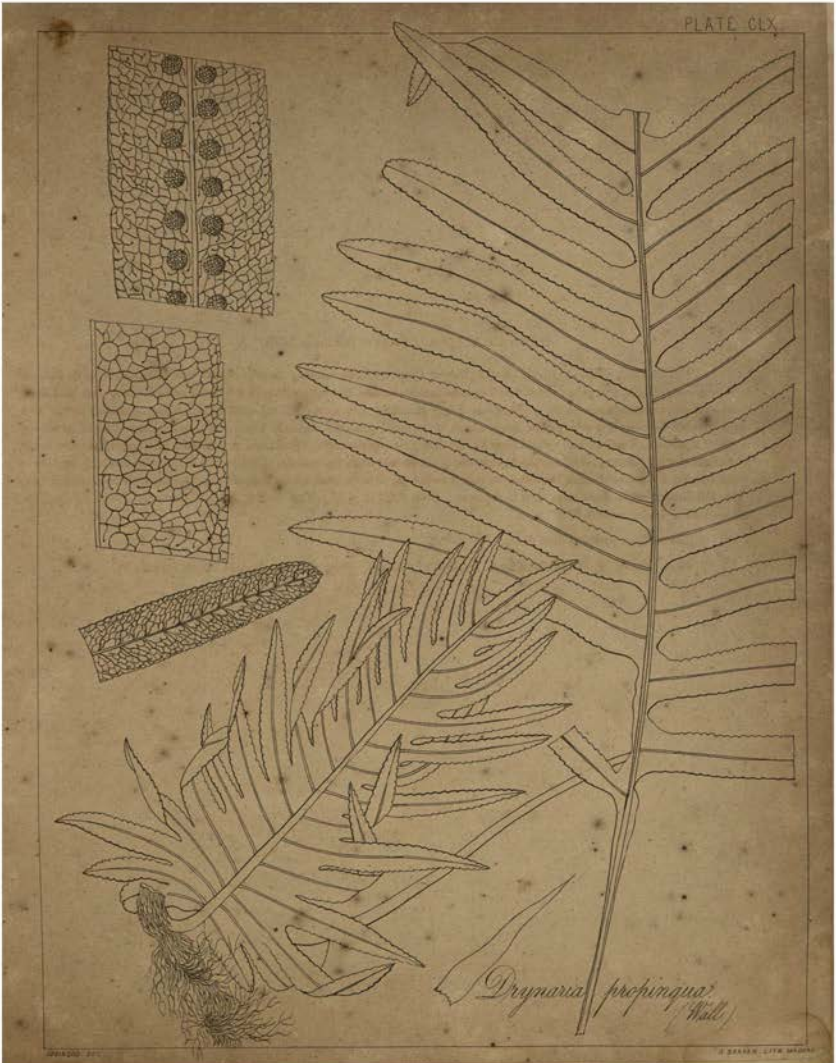
DRYNARIA PROPINQUA. (Wall.) Caudex long very stout creeping densely clothed with lanceolato-subulate delicate membranaceous fringed ferruginous scales, fronds coriaceo-membranaceous dimorphous; sterile 4-6 inches and more long firm and hard scarioso-membranaceous brown sessile cordato-ovate deeply pinnatifid with narrow oblong acute rarely obtuse segments; fertile ones long stipulate 1-2 feet long oblong-ovate deeply almost to the rachis pinnatifid, segments 4 inches to a span or more long linear-oblong acute or acuminate subentire (one specimen from Khasya deeply sinuato-pinnatifid) lowest ones distant and subdecurrent, venation manifest slight elevated (so as to give a sculptured character to the surface when dry) costules subreniform flexuose connected by transverse veins forming 4-5 areoles of which the costal one only is soriferous, ultimate small areoles subquadrangular often with free included veinlets, sori forming only a single series close to the costa. *Hook. Sp. Fil.* v. 97; *Wall. Cat. n.* 293.—Phymatodes *Presl*;—Polp. Willdenovii. *Bl. Fil. Jav. p.* 156 t. 66 f

The specimen figured is from Simla.

Hab. Nepaul, Simla, Sikkim, Khasya, Assam, (5-7,000 alt.), Tropical Africa, Prince's Island, Ferando Po.

PLATE No. CLX.

PLATE CLX.



Drynaria propinqua (Wall.)

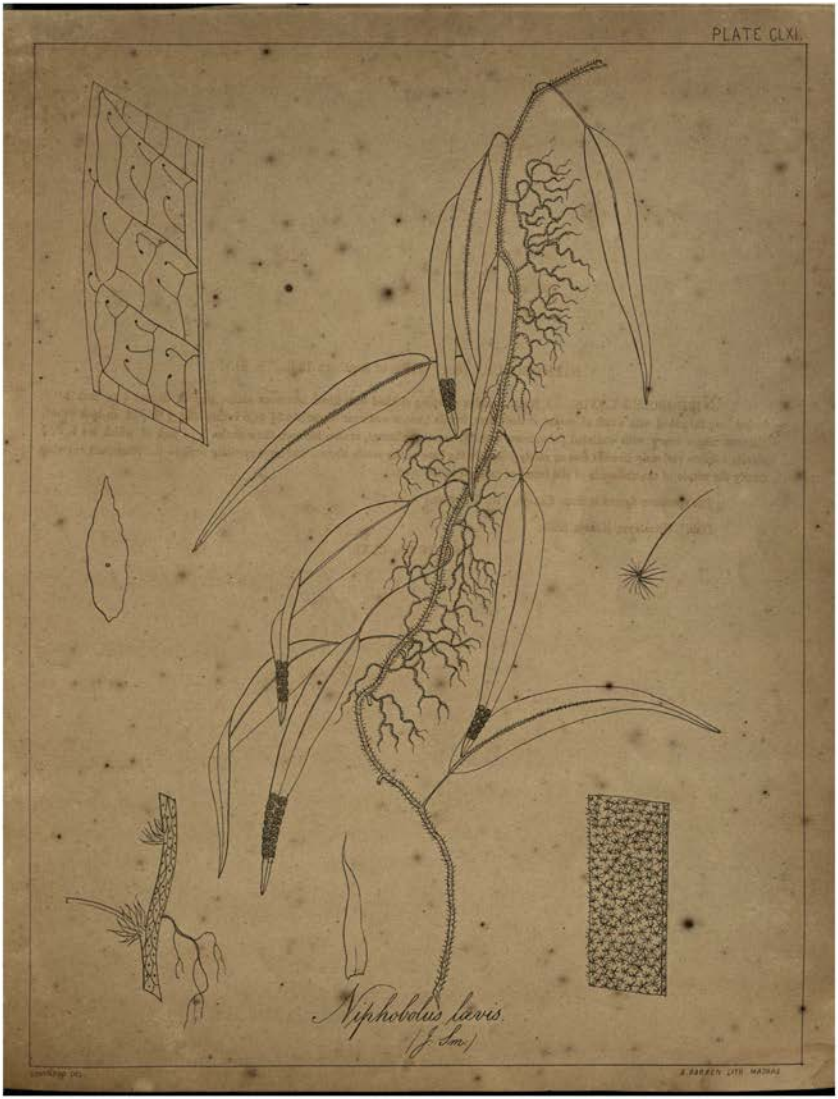
NIPHOBOLUS. (See "Ferns of Southern India," p. 61.)

NIPHOBOLUS LÆVIS. (J. Sm.) Caudex creeping clothed with linear setaceous scales, stipites distant ½ an inch to 2 inches long furnished with a tuft of scales at their base, fronds coriaceous linear lanceolate 2½ to 6 inches long, ¼ to ¾ of an inch broad, glabrous above hoary with stellated pubescence beneath, venation obscure, areoles between the costules 3, in each of which are 1, 2, 3 clavate veinlets variously directed free or rarely joined to the base of the areole above. Sori large partially sunk in the tomentum covering nearly the whole of the underside of the frond or confined to the apex.

The specimen figured is from Khasya, (Dr. Thomson.)

Hab. Himalayas, Khasya Hills.

PLATE No. CLXI.



Niphobolus lævis.
(J. Sm.)

LOVELL REEVE DEL. B. PARKEN LITH. MADRAS

NIPHOBOLUS.

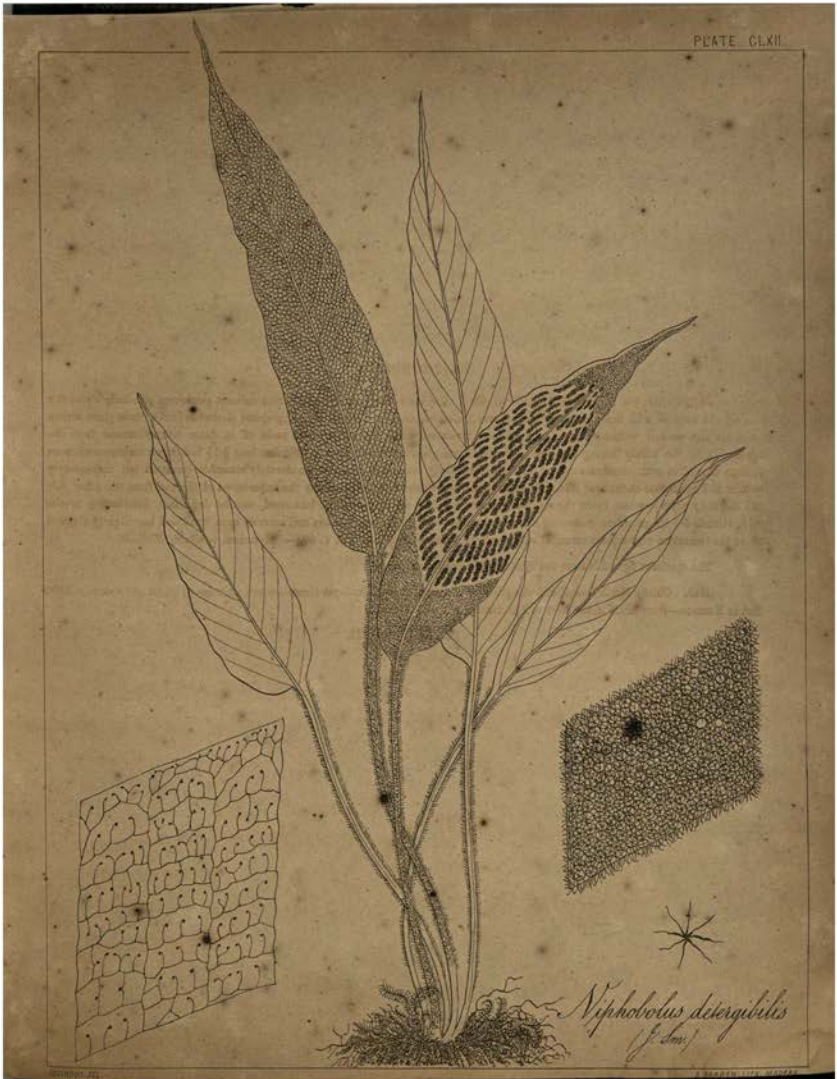
NIPHOBOLUS DETERGIBILIS. (J. Sm.) Caudex rather stout densely fibroso-radicant paleaceous especially about the base of the stipites with finely subulate ferruginous scales, stipites 4-6-8 inches long aggregated clothed as is the whole plant with a dense compact mass of whitish or ferruginous stellated tomentum which not unfrequently peels off in dense cottony masses from the upper side of the fronds leaving that part quite naked and glabrous, fronds from 4-16 inches long ¾-1½ inch broad carnoso-coriaceous younger ones often ovato-acuminate mature ones lanceolate finely acuminate subsinuate moderately attenuate decurrent not unfrequently broader and subhastate at the base then suddenly cuneate, sometimes wrinkled above by the impressions of the sori from the other side and obscurely nigro-punctate, below the stellated tomentum is long retained, venation immersed, costules indistinct, intervening areoles 9-15, veinlets 3-5 irregular free or meeting a veinlet from the base of the areole above sori scarcely sunk small and but slightly elevated above the tomentum very copious arranged with great regularity.—*Hook. Sp. Fil.* v. 49;—Polypodum vestitum. *Wall. Ms.*

The specimen figured is from the Himalayas (Dr. Stewart.)

Hab. Chiefly North Bengal and along the lower ranges of the Himalayas from very low altitudes of Silhet and Assam to 3,500 feet in Kumaon—from Simla in the west to Bhootan in the east. Nepal.

PLATE No. CLXII.

PLATE CLXII.



Niphobolus detergibilis
(J. Sm.)

GONIOPHLEBIUM. (See page 5.)

GONIOPHLEBIUM LACHNOPUS. (Wall.) Caudex long creeping thick as a writing-pen densely clothed with long black setaceous bristles, stipes 2-4 inches long stramineous-brown, fronds membranaceous 6-8 inches to 1½ foot long 1½-3¾ inches wide oblong terminating in an acuminated nearly entire apex, deeply nearly to the rachis pectinato-pinnatifid, segments linear or linear-oblong acute or obtuse, dentato serrate, lowest pair sometimes deflexed, veins forming a costal soriferous series of large areoles (partially free) marginal veinlets short free clavate, soriferous veinlet arising from the side of the vein distant from the costule, sori orbicular rarely oval, nearer the costa than the margin, rachis beneath often subpaleaceous with orbicular spinuloso-dentate scales terminated by a long seta. *Hook. Sp. Fil.* v. 25; *Wall. Cat.* n. 310.—Polypodium Fieldingianum. *Kze.—Mett. Polyp.* 75.

The specimen figured is from Simla, (Dr. Stewart.)

Fig. A. is a pinna of a curiously cut variety from Sikkim, (Dr. Anderson.) Fig. B. is a pinna of a frond with free venation.

Hab. Nepaul, Kumaon, Khasya (4-6,000 feet) Sikkim, (9-11,000 feet) Simla, Kumaon (7,000 feet.)

PLATE No. CLXIII.

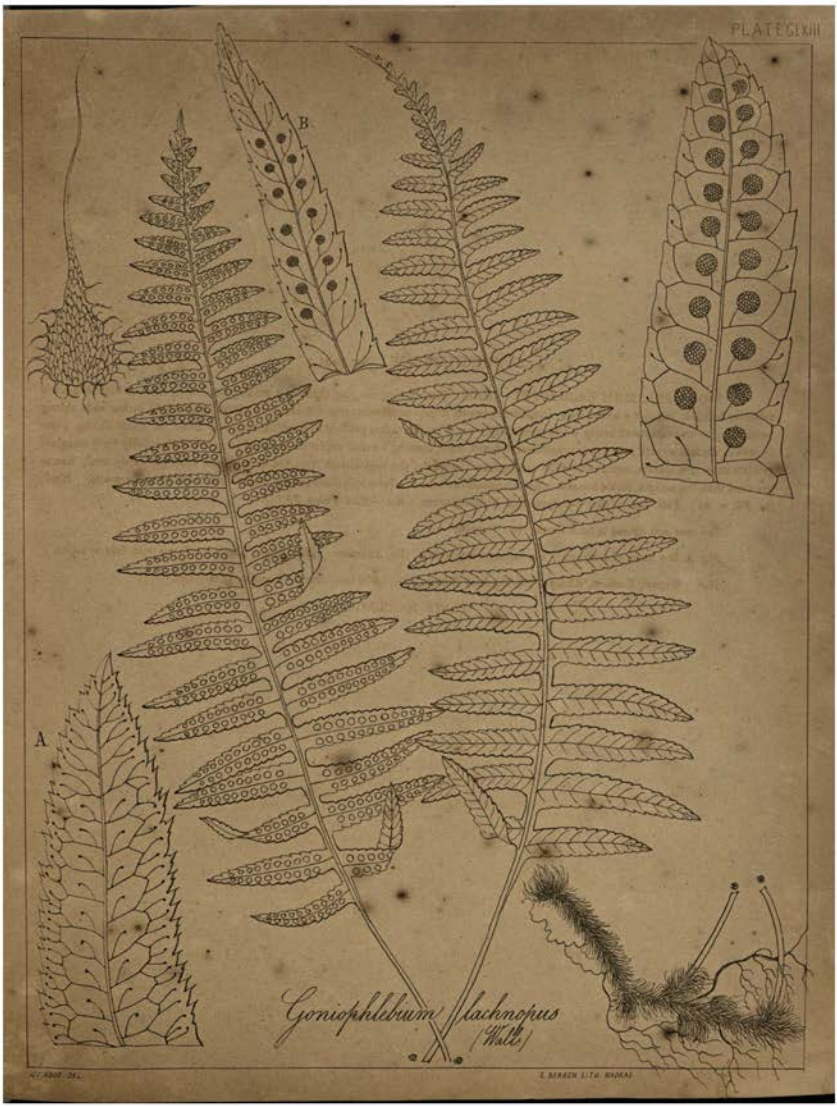


PLATE CLXIII
B
A
Goniophlebium lachnopus
(Walle)
S. BERGEN LITH. MADRAS

§ 14—PLATYLOMEÆ.

(b.) *Fertile divisions siliculiform.*

CRYPTOGRAMMA. R.-Br. App. Frankl. Journ. 767.

(Allosori Sp. *Auct.*;—Gymnogrammatis Sp. *Presl*;—Phorolobus *Sp. Fée.*)

Gen. char. *Sori* spuriously-indusiate, oblong or linear, at length laterally confluent into an intramarginal band, covered by the revolute attenated indusiiform margins of the pinnules; the *receptacles* also oblong or linear, near the apices of the veins. Veins simple or forked, from a central costa, which is sometimes evanescent in the sterile fronds; venules free.

Fronds dimorphous, dwarf, herbaceous, bi-tri-pinnate, the fertile contracted, *i. e.*, with revolute siliculiform pinnules. Rhizome short decumbent. Differs from Allosorus in having oblong oblique not punctiform receptacles. (Moore.)

CRYPTOGRAMMA BRUNONIANA. (Wall.) Caudex short thick subrepent, roots fibrous, fronds erect stout somewhat rigid, pinnules of the sterile fronds of two kinds, subovate deeply cut into 2-5 oblong segments, rarely elliptical and pinnatifid serrated those of the mature fertile fronds rather broad oblong with the margins spread open (not permanently revolute). *Wall. Cat.* 396. *Hook. et Grev. Ic. Fil. t.* 158. C. crispa. var. B. *Hook. Sp. Fil.* ii. 129.—Gymnogramme Brunoniana. *Presl. Tent. Pterid. p.* 219.—Phorolobus Brunonianus *Fée. Gen. Fil. p.* 131.

The specimen figured is from Sikkim-Himalaya elev. 13,000 feet (Dr. Thomson.)

Hab. North India, Kumaon, 12,000 feet.—Balti. N. W, Thibet. Shayak Valley 9,000 feet, above Simla, Sikkim-Himalaya. 11-13,000 feet, Choor.

PLATE No. CLXIV.

Gymnogramma Brunoniana
Wall.

PLAGIOGYRIA. (See page 51.)

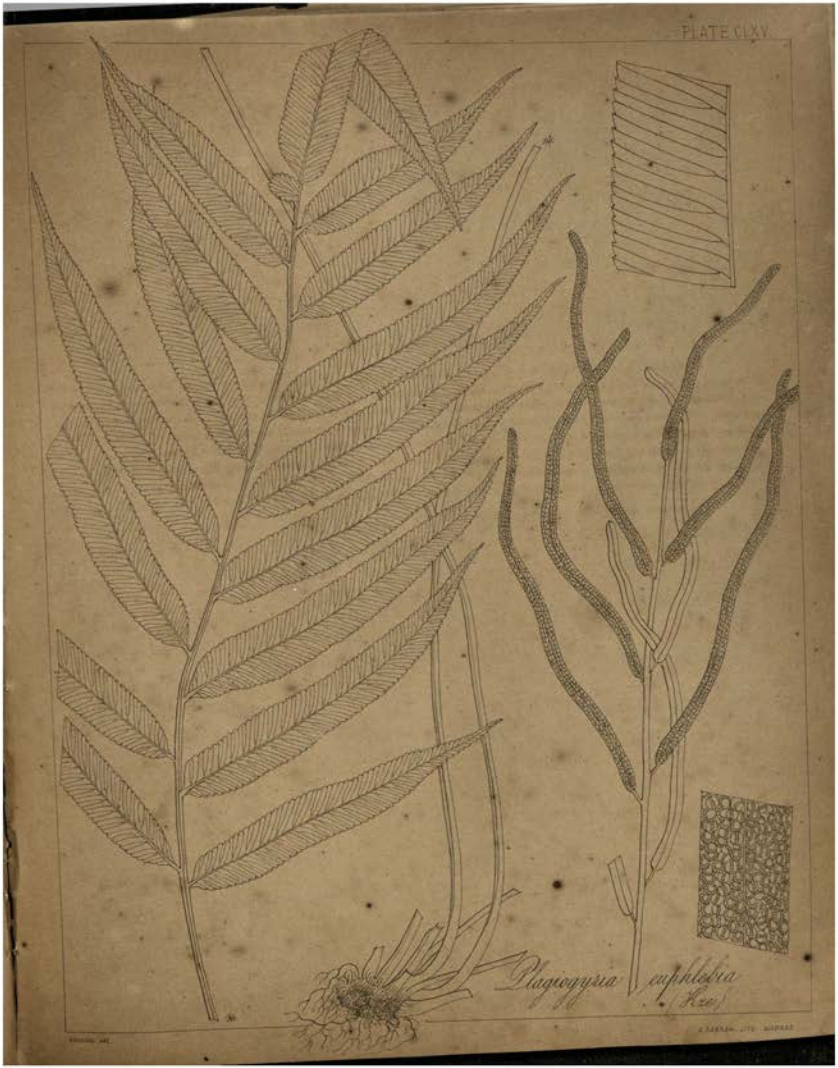
PLAGIOGYRIA EUPHLEBIA. (Kze.) Caudex stout woody a foot high, fronds cæspitose on long stipites incrassated triquetrous and carnose and bearing spongy glands at the base, fronds pinnate throughout 1-2 feet long subchartaceous, olive-brown when dry, sterile ones broadly ovate-lanceolate, pinnæ erecto-patent 5-6 inches long remote uniform the ultimate quite free larger than the rest, all sessile or the lower ones shortly but distinctly petioled elongato-lanceolate quite cuneate at the base, the margin bluntly and rather obscurely serrated the acuminated apex strongly serrated the base beneath destitute of glands, veins rather distant mostly once forked, fertile fronds narrower and more oblong, pinnæ linear or broad linear elongated obtuse, capsules clothing the whole under side between the costa and the brown membranaceous involucre.—*Hook. Sp. Fil.* iii. 20.—*Kze. in Bot. Zeit.* vi. 521;—Acrostichum triquetrum. *Wall. Cat.* n. 23 *in part*;—Olfersia triquetra *Tent. Pter. p.* 234.—Stenochlæna triquetra *J. Sm. in Hook Journ. of Bot.* iv. *p.* 149.

The specimen figured is from Khasya, (Dr. Thomson.)

Hab. Nepaul, Assam, Khasya (alt. 6,000), Japan.

PLATE No. CLXV.

PLATE CLXV.



Plagiogyria euphlebia (Kze)

LINDSÆA. (See "Ferns of Southern India," p. 7.)

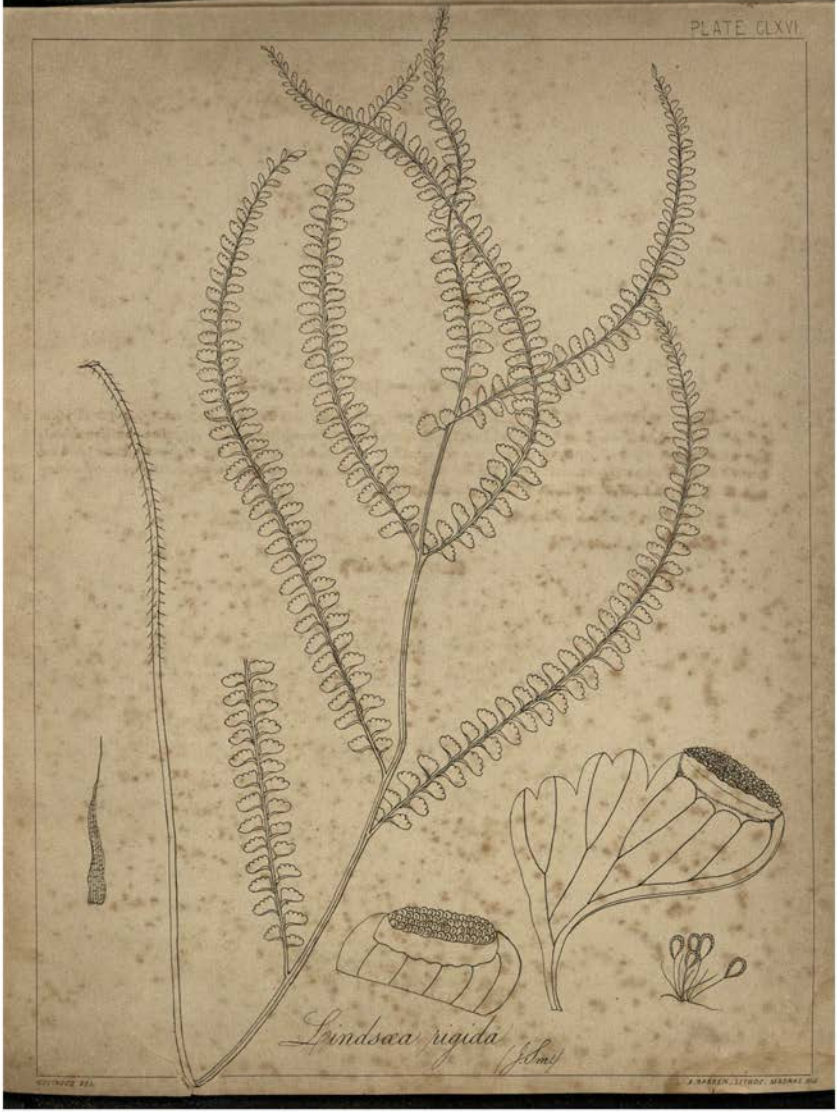
LINDSÆA RIGIDA. (J. Sm.) Caudex long creeping scaly, rough with short distant inconspicuous prickles, frond bipinnate rigid (rufescent) subfalcate, pinnæ 7-9 remote linear alternate falcate, terminal one very long, pinnules approximate coriaceous flabellate or rhombeo—or oblong—flabellate, upper base truncate, lower margins straight or slightly arched, upper one semi-circular lobed and crenated margined, veins very prominent on both sides, sori abbreviated quite marginal on one or two terminal lobes, involucres coriaceous. *Hook. Sp. Fil.* i. 217. *J. Sm. in Hook. Journ. of Bot.* iii. p. 415.

The specimen figured is from Malacca.

Hab. Malacca, Mount Ophir.

PLATE No. CLXVI.

PLATE CLXVI.



ADIANTUM. (See "Ferns of Southern India," p. 1.)

ADIANTUM PEDATUM. (L.) Frond flabelliform bipartito-pedately divided tripinnate, secondary pinnæ lanceolate, pinnules membranaceous dimidiate oblong antrorsely subfalcate broadest at the superior truncated base very obtuse, lowest ones triangular-cuneate all petiolate, superior margin obtusely lobed, lobes soriferous, sori oblong rarely curved, stipes and rachis ebeneous glabrous. *Hook. Sp. Fil.* ii. 28. *Linn. Sp. Pl.* 1557. *Sw. Syn. Fil.* 121;—Adiantum boreale *Pr. Tent. Pter. p.* 158.

The specimen figured is from the Himalayas, (Dr. Stewart.)

Hab. Northern India, Kumaon, Jumnotri, North America, Virginia to Canada (Lake Huron); North West America, California to Sitka; Unalaschka.

PLATE No. CLXVII.

PLATE CLXVII

Andiantum pedatum

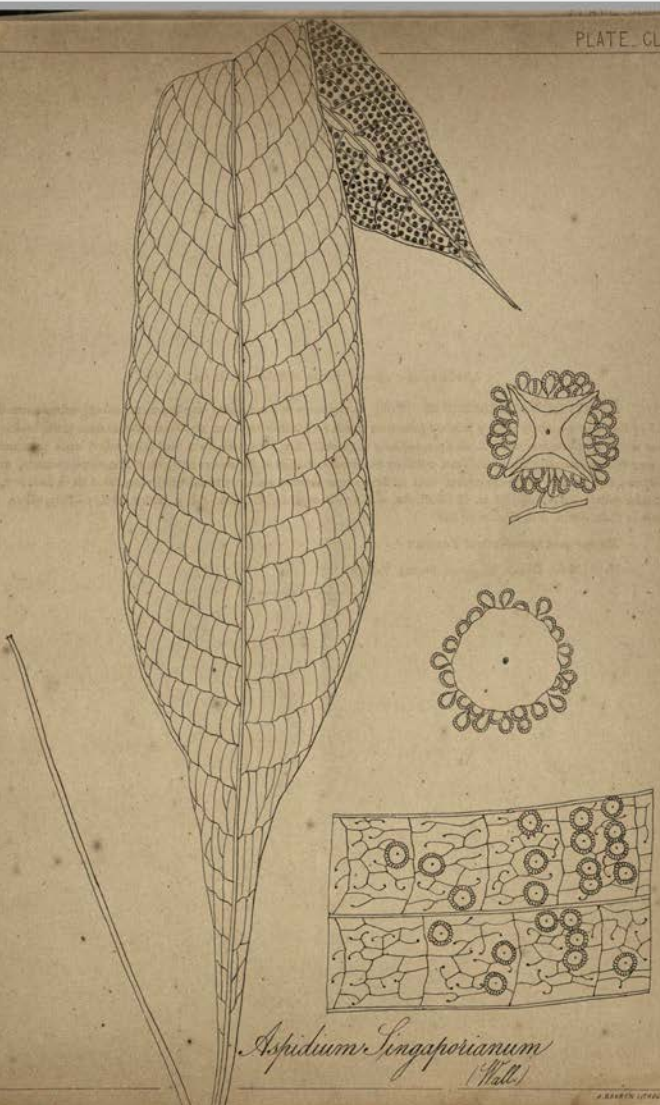
ASPIDIUM. (See "Ferns of Southern India," p. 40.)

ASPIDIUM SINGAPORIANUM. (Wall.) Caudex more or less creeping very fibrous, stipites approximate sometimes tufted 6-12-14 inches long sparsely setosely subalato-paleaceous, fronds 6-12 inches long firm membranaceo-coriaceous (dark brown when dry), ovate or oblong, much acuminated at the apex, suddenly or generally long, decurrent at the base quite entire, costa prominent beneath, primary veins horizontally patent subfalcate united by transverse arched ones, the areoles of which enclose netted veinlets, the ultimate ones free; sori forming transverse arched lines in double rows between secondary (transverse) veins about six in each row, involucres orbicular peltate. *Hook. Sp. Fil.* iv. 42. *Wall. Cat. n.* 374;—Podopeltis, *Fée. Gen. Fil. p.* 286. *t.* 23 *A.*;—Polypodium Phyllitidis *Roxb. in Calc. Journ. Nat. Hist.* iv. *p.* 483.

The specimen figured is from Singapore.

Hab. Malay Islands, Singapore, Penang, Malacca.

PLATE No. CLXVIII.



Aspidium Singaporianum
(Wall.)

SAGENIA. (See "Ferns of Southern India," p. 27.)

SAGENIA ALATA. (Wall.) Caudex creeping? Stipites rather distant 1-2 feet long but winged a long way down sometimes almost to the base and there subulato-paleaceous, fronds subcoriaceo-membranaceous 2-3 feet and more long oblong deeply pinnatifid with 4-5 pairs of distant oblong (6-18 inches long and 1-2 wide) or strap-shaped acuminated segments, inferior ones entire or bipartite, primary veins horizontally patent slender, connected by transverse zigzag secondary ones forming areoles which include anastomosing veins with free veinlets, sori small very copious scattered without order arising from reticulations (hence compital) not extending to the margin, involucre small cordate. *Hook. Sp. Fil.* iv. 47. *Wall. Cat. n.* 378;—Bathmium *Fée.*;—Aspidium vastum, *Bl. En. p.* 142.

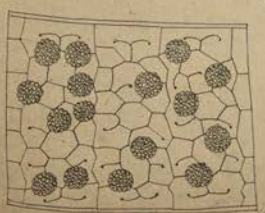
Very nearly allied to S. pteropus (Kze.), but the sori are copious and scattered without order, instead of being in two rows between the primary veins, the magnified portion in the figure represents a portion of the frond between two primary veins.

The specimen figured is from the Khasya Hills, the involucres had all fallen off and so are not represented.

Hab. Sylhet, Khasya, Assam, Malacca, Singapore, Borneo, Java.

PLATE No. CLXIX.

PLATE. CLXIX.



Tagenia alata Wall.

SAGENIA.

SAGENIA VARIOLOSA. (Wall.) Caudex stout creeping, stipites approximate subcæspitose a span to 1-1½ foot long, sparingly paleaceous at the base, fronds coriacco-membranaceous a span to a foot and more long, glabrous cordate or cordato-ovate acuminate trifoliate or more frequently pinnate with two or three nearly opposite pairs of pinnæ and a larger terminal one more or less-petiolate, lowest pair large half-ovate bifid or bipartite or bifoliate, intermediate pairs lanceolate lobato-pinnatifid, inferior lobes the longest, terminal one sub-rhomboidal below, deeply pinnatifid with long acuminated entire of lobed segments, primary veins from the costa patent slender more or less waved remote, the rest of the veins uniformly anastomosing with areoles enclosing free simple or forked veinlets, sori scattered most copious near the margins of the pinnæ compital or more frequently terminal on a vein within a large areole. *Hook. Sp. Fil.* iv. 51. *Wall. Cat. n.* 379;—Sagenia variolata *Moore?*—Aspidium coadunatum? in part Mett. Asp: p. 281.

Very closely allied to Sagenia coadunata.

The figure represents the upper portion of a frond and is taken from a specimen from Parasnath, Bengal, (Dr. Thomson.)

Hab. Amherst, Tavoy, Penang, Moulmein, Chittagong, Mergui, Parasnath, Telyn above Sylhet.

PLATE No. CLXX.

Sagenia variolosa
(Wall.)

GOVINDOO DEL.

A. BARREN-LITHOG. MADRAS 1886

POLYPODIEÆ.

Margins of the fronds revolute, indusioid (i.e., sori spuriously indusiate.

STRUTHIOPTERIS.—*Willd. Mag. Nat. Ber.* 1809. 160.

(Onocleæ, *Bernhardi and Auct.* Osmundæ Sp. Linnæus.)

Gen. Char. *Sori* spuriously-indusiate, rotundate, approximate, at length becoming sub-confluent, covered by the revoluto-convolute attenuated (membranaceo-scariose) margin of the frond, which simulates an universal indusium; the *receptacles* medial prominent. *Veins* simple or forked, from a central costa; *venules* free.

Fronds demorphous, the sterile herbaceous pinnato-pinnatifid; the fertile pinnate, with the pinnæ much contracted moniliform, the margins rolled inwards so as to cover the sori; Rhizome erect caudiciform, producing stolones. (*Moore.*)

A genus with a very doubtful resting place in the classification of ferns. Sir Wm. Hooker unites it with Onoclea, a genus with anastomosing venation and a cucullate membranaceous indusium of doubtful structure, and states that a very fragile inferior involucre has been detected in Struthiopteris Germanica (an allied species), although he could detect nothing of the sort in dried specimens of this species. Mettenius also unites the 2 genera and places them next to Woodsia. Moore follows Willdenow in keeping the 2 genera distinct, but places the present genus in Polypodiee, and Onoclea in the Aspidiee.

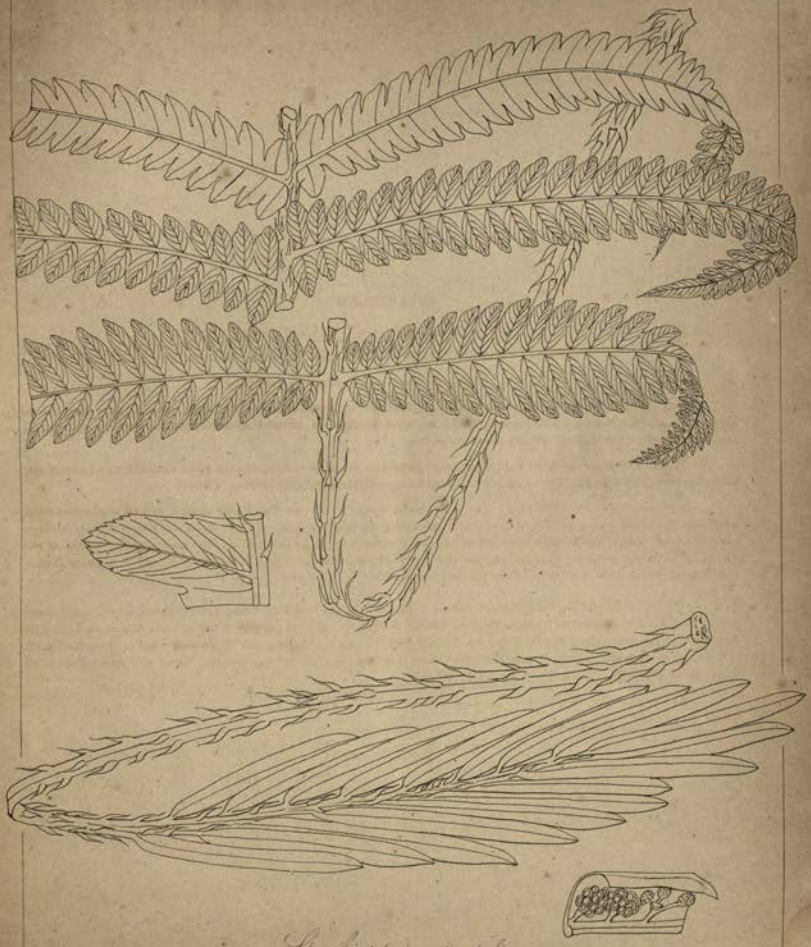
STRUTHIOPTERIS ORIENTALIS. (Hook.) Fronds 1-2½ feet long ovato-oblong not attenuated below, fertile fronds oblong, often 2-feet long contracted broad linear-oblong flattened 2-edged, the refracted margins at first covering the whole back of the frond dark purple brown glossy involucriform, entire at the edge, at length spreading, torn at the margin and exposing the fructification which is eventually confluent in a continuous line, stipes rachis and costa deciduously paleaceous. Onoclea (Struthiopteris) Orientalis. *Hook. 2nd Cent. of Ferns, tab.* 4; *Sp. Fil.* iv. 161.

The figure is taken from Hooker's 2nd Cent. of Ferns.

Hab. Sikkim, Himalaya (elev. 12,000 feet), Assam, Hakodadi, Japan.

PLATE No. CLXXI.

PLATE CLXXI



Struthiopteris orientalis
Hook.

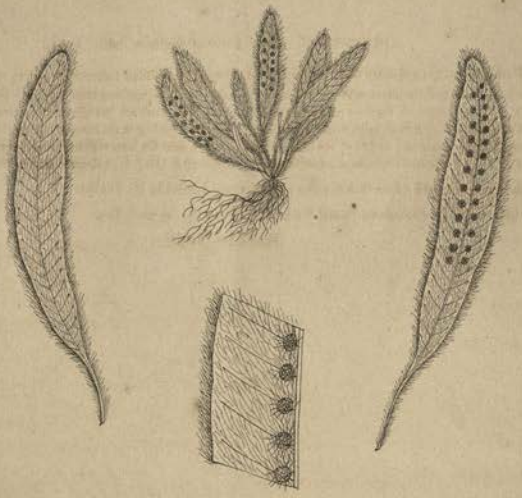
POLYPODIUM. (See "Ferns of Southern India," p. 54.)

POLYPODIUM LASIOSORUM. (Hook.) Caudex very small indistinct radiculoso-cæspitose, stipites tufted ½ an inch and rather more long slender filiform villous with patent ferruginous hairs, fronds subcoriaceo-membranaceous spathulato-lanceolate obtuse quite entire much attenuated at the base rather densely villous with long patent soft ferruginous hairs more or less deciduous in age, and ciliated on the margin with short hairs, veins simple never forked not extending to the margin, slightly thickened at the apex, sori globose occupying the upper half or ⅔ds of the frond, one on each vein near the base, copious hairs are intermixed with the capsules. *Hook. Sp. Fil.* iv. 166;—Grammitis pusilla, γ. lasiosorum. *Bl. En. Fil. Jav. p.* 110. *f.* 6. ;—Grammitis nana. *Fée, 6me. Mém. p.* 7. *t.* 6. *f.* 1.

The specimen figured is from Ceylon, where it has just been detected by Mr. Thwaites.

Hab. Ceylon (Bogawantalawa, Central Provinces, 5,000 feet elev. on trees), Java.

PLATE No. CLXXII.



Polypodium lasiosorum
(Hook.)

POLYPODIUM.

POLYPODIUM KHASYANUM. (Hook.) Caudex short creeping scaly, stipites short tufted (articulated upon the caudex) fronds a span to 14 inches long 1-1½ inch broad subcoriaceo-membranaceous hairy below and on the costa deeply nearly to the rachis pinnatifid with very acute sinuses, segments approximate horizontally patent from a broad and subdecurrent base oblong obtuse or the lower ones subtriangular or short and rounded entire or subsinuate ciliated, costules flexuose, and simple oblique veins apparent, sori short-oval eight or ten on each segment in 2 rows nearer the margin than the costa sunk into an oval cavity (having an elevation on the upper side of the frond) bordered by a raised margin. *Hook. Sp. Fil.* iv. 191. *Ic. Pl. t.* 949. *Cent. of Ferns, t.* 49. *Mett. Poly. p.* 50.

The figure is taken from Sir W. Hooker's Cent. of Ferns.

Hab. Khasya Hills, 4,000 feet elevation,—Assam.

PLATE No. CLXXIII.

Polypodium Khasyanum
(Hook.)

POLYPODIUM.

POLYPODIUM DAREÆFORME. (Hook.) Caudex thickish creeping densely ferrugineo-palcaceous with lanceolate much acuminated scales, stipes 4 inches long glossy pale-chestnut colored, frond a span long ovato-deltoid submembranaceous bipinnate, primary pinnæ 4-5 inches long 1½ inch wide, oblong-lanceolate subsessile acuminate subpinnatifid, segments linear or subspathulate obtuse simple or bifid, veinlets solitary in each segment clavate terminating below the apex bearing a sorus generally much below the clavate apex, capsules very few in each sorus. *Hook. Sp. Fil.* iv. 256. *2nd Cent. of Ferns*, *t.* 24.

The figure is taken from the 2nd Cent. (of Ferns.)

Hab. Khasya Hills, Birmah, (Parish in lit.)

PLATE No. CLXXIV.

Polypodium dareaforme
(Hook.)

TÆNIOPSIS. (See "Ferns of Southern India," p. 18.)

TÆNIOPSIS FALCATA. (Kze !) Caudex erect, fibrillose, furnished with lanceolate smooth brown scales at the apex, fronds rigid very thick 1 to 6 inches long 1½-3 lines broad narrow linear acute, sometimes forked, glabrous or sometimes furnished on the upper side only with a few distant white hairs, costa canaliculate on the upper side of the frond, not visible on the underside; veins (only visible in very young fronds when well soaked) simple, or once, (or very rarely twice) forked not extending to the margin, sori in a deep gaping sulcus somewhat distant from the margin. *Vittaria falcata. Fée. Vittar, p.* 20. *t.* 4. *f.* 1. Vide Thw: En: p. 438.

The specimen figured is from Ceylon, where it has just been discovered by Mr. Thwaites.

Hab. Ceylon (Central Provinces, elevation 4,000, 5000 feet) c. P. 3,807,—Java, Mount Ophir, Malacca.

PLATE No. CLXXV.

Tæniopsis falcata. (Ryc)

LOVINDOO DEL.

A. HARREN LITHOG. MADRAS

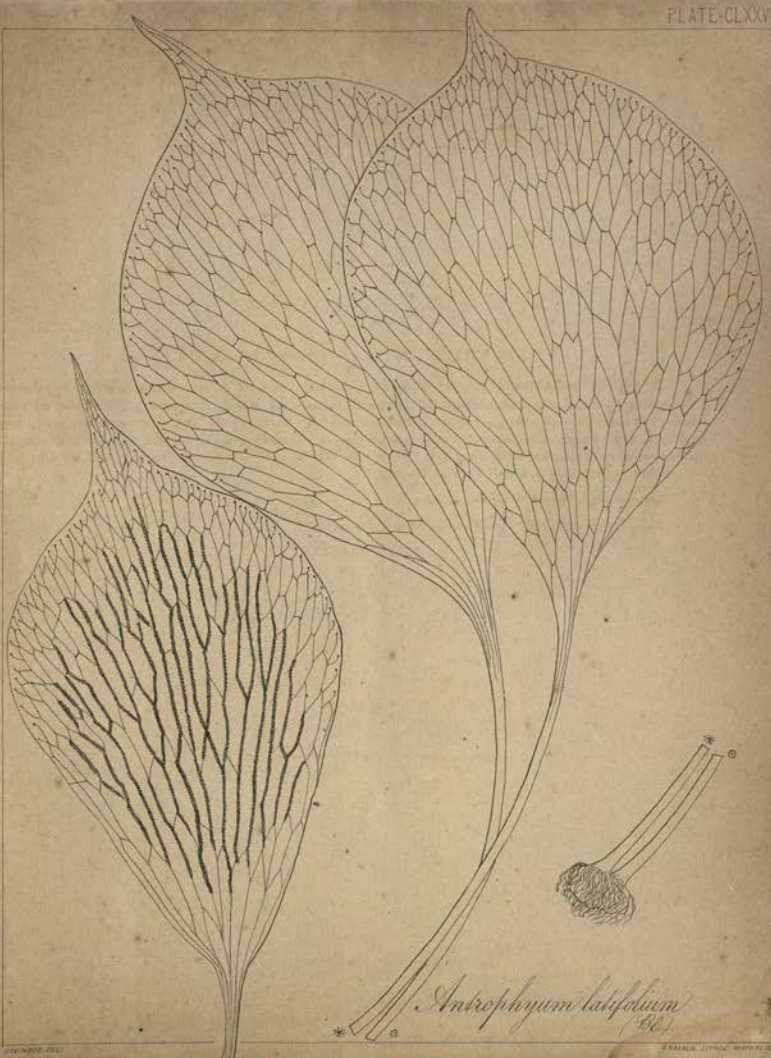
ANTROPHYUM. (See "Ferns of Southern India," p. 17.)

ANTROPHYUM LATIFOLIUM. (Bl.) Stipites 3-6 inches long compressed 2 lines wide, fronds subcarnoso-coriaceous 3-7 inches long 3-5 inches wide ovato-subrhomboidal or obovate suddenly and sharply acuminated and sometimes subinciso-lobate below the acumen, the base cuneate and rather suddenly attenuated into the stipes, costa none, venation manifest, areoles very large oblongo-hexagonal subflabellately directed, most elongated in the disk, sori chiefly occupying the disk, very superficial elongated simple or branched rarely reticulated. *Hook. Sp. Fil.* v. 172. *Bl. En. Fil. Jav. p.* 75, *en note*;—A. Boryanum ;—*Bl. Fil. Jav. p.* 75 *t.* 31. *excl. Syns.* ;—Hemionitis Blumeana,—*Pr. Tent. Pter. p.* 221.

The specimen figured is from the Khasya Hills.

Hab. Java, Khasya lower ranges, Mountains North of Assam.

PLATE No. CLXXVI.


Antrophyum latifolium
(Bl.)

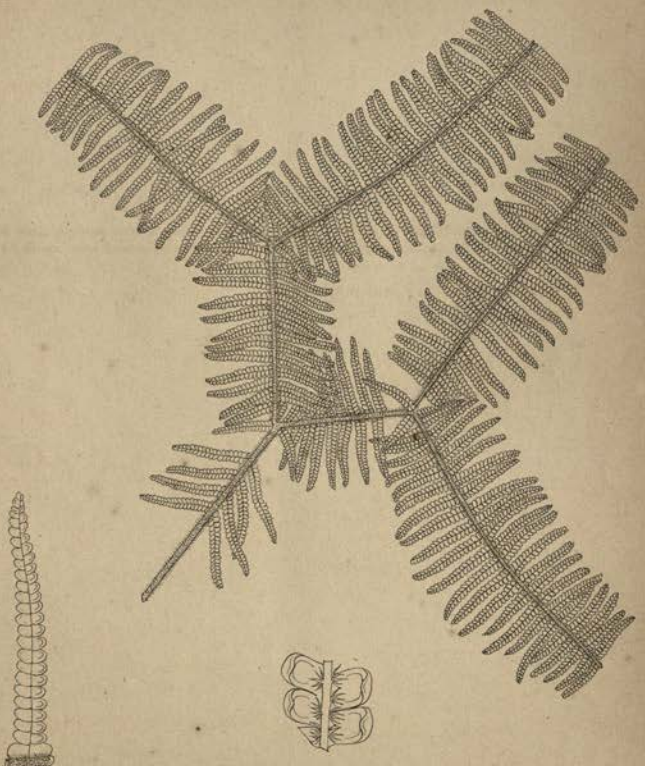
GLEICHENIA. (See " Ferns of Southern India," p. 25.)

GLEICHENIA SEMIVESTITA. (Labill.) Fronds dichotomous divaricated, branches pectinate, pinnæ pinnatifid, segments orbicular ovate slightly concave, branches densely ferrugineo-pubescent, rachis with few stellated hairs, capsules 3-4 exserted. *Labill. Sert. Nov. Caled. p.* 8, *t.* 11. *Hook. Sp. Fil.* 1. *p.* 3.

The figure is taken from Sir W. Hooker's Sp. Fil.

Hab. Malacca, New Caledonia.

PLATE No. CLXXVII.



Gleichenia semivestita
(Labill)

A. BARPEN. LITHOG. MADRAS.

DAVALLIA. (See "Ferns of Southern India," p. 5.)

DAVALLIA TRICHOMANOIDES. (Bl.) Caudex creeping, furnished with narrow linear long-pointed golden scales, fronds subtripdicato-pinnate membranaceous glabrous, pinnæ sub-rhombeo ovate rather remote, pinnules trapezoid oblong deeply pinnatifid, segments narrow cuneato-linear obtuse subbifid, fertile ones truncato-emarginate at the apex with a solitary sorus segments oblong truncate, rachis margined above and as well as the subtrigonal stipes glabrous. *Bl. En. Fil. Jav. p.* 238 ;—Hook. Sp. Fil. 1. 186.

The specimen figured is from Ceylon, where it has just been detected by Mr. Thwaites. (c. P. 3903.)

Hab. Ceylon, (Adam's Peak on the Saffragam side, elevation 5,000 feet), Mountains of Java ; the Moluccas.

PLATE No. CLXXVIII.

Davallia trichomanoides.
(Bl.)

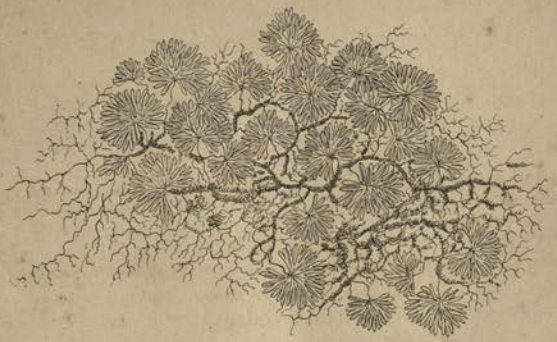
TRICHOMANES. (See "Ferns of Southern India," p. 2.)

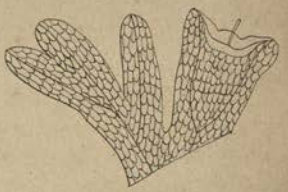
TRICHOMANES PARVULUM. (Poir.) Caudex creeping densely matted tomentose, fronds reniform or rotundato-cuneate stipitate incise-palmate glabrous, segments linear obtuse emarginate or bifid, involucres terminal sunk subturbinate, the mouth spreading obscurely two lipped, receptacles slightly exserted. *Hook. Sp. Fil.* i. 118 ;—*Poir. encycl. Bot.* viii. *p.* 44. *Bl. En. Fil. Jav. p.* 223 ;—T. Sibthorpioides, *Bory. in Willd. Sp. Pl.* v. *p.* 498.

The specimen figured is from Coonoor (Nilgiri Hills), where it was first detected by the Rev. T. Whitehouse.

Hab. Bourbon, Java, Philippine Islands, Moluccas, New Ireland, Madagascar, Nilgiri Hills (South India.)

PLATE No. CLXXIX.





Trichomanes parvulum
(Poir.)

TRICHOMANES.

TRICHOMANES JAVANICUM. (Bl.) Roots long, coarse-descending wiry fibres, stipes and rachis setose, fronds tufted lanceolate rigid (black when dry) pinnated, pinnæ gradually smaller towards the base and apex (the upper ones fertile) sessile or subpetiolate, oblong, obliquely cuneate at the base, obtuse at the apex, serrate or crenate, with some of the serratures on the lower margin long and bristle-like (formed by excurrent veins) veins generally terminating within the margin but often touching the margin, and excurrent, involucres urceolate, with the mouth entire 2 to 4 on the upper margin of the superior pinnæ which are gradually more and more contracted towards the apex of the frond receptacles very much exserted. *Bl. En. Fil. Jav. p.* 224. *Hook. Sp. Fil.* 1.130;—T. rigidum. *Wall. Cat. n.* 161 *not Sw.*;—T. setigerum *Wall. Cat. n.* 138;—T. rhomboideum. *J. Sm. En. Fil. Philipp.*;—T. curvatum. *J. Sm*; *l. c.*;—T. alatum *Bory in Duperrey Voy. Bot. p.* 282. *t.* 38. *f.* 2. *not Sw.*

The specimen figured is from Birmah (Parish)

Hab. Birmah, Chittagong (Dr. Anderson), Java, Singapore, Penang, Malay Islands, Phillippines, Oualan.

PLATE No. CLXXX.

PLATE CLXXX.

Trichomanes Javanicum.
(Bl.)

TRICHOMANES.

TRICHOMANES RADICANS (Sw.) Caudex very long more or less tomentose, fronds ovate or oblong acuminate erect rather firm membranaceous bi-tri-quadripinnatifid dark green and opaque (when dry) primary divisions ovate or lanceolate cuneate at the base, the segments linear-oblong rather short obtuse emarginate or bifid, involucres supra-axillary cylindrical tapering below sunk in the more or less narrow short segments and hence more or less winged at the sides, the mouth scarcely spreading imperfectly or shortly 2-lipped sometimes wider than the tube, receptacles (when perfect) filiform many times longer than the tube, stipes short or long tereti-compressed winged nearly to the base sometimes broadly so. *Hook. Sp. Fil.* i. 125;—*Sw. Fl. Ind. Occ., p.* 1736;—T: anceps. *Wall. cat. n.* 166 (*not Hook*);—T: umbrosum. *Wall cat. n.* 165;—T: scandens *Hedw. Fil. cum. Ic.*;—T: diaphanum. *H. B. K. Nov. Gen. Am.* 1. *p.* 25;—T: ambiguum. *Sieb. Syn. Fil. n.* 143;—T: speciosum. *Wild. Sp. Pl.* v. *p.* 514;—T. pyxidiferum. *Huds. Fil. Angl. p.* 461. (*not Linn.*)—T; brevisetum. *Br: in. Hort. Kew. ed.* 2. 5. *p.* 529;—T: alatum. *Hook. in. Fl. Lond. n. ser.* iv. *t.* 53 (*not Sw.*);—T. Europœum. *Sm. in Rees' Cycl*;—T: Hibernicum. *Spr.*;—Hymenophyllum rupestre. *Radds. Fil. Bras. p.* 67 *t.* 80;—H. alatum. *Sm. in E. Bot. t.* 1417;—H. Tunbridgense. *β. Sm: Fl. Brit. p.* 1142;—Didymoglossum alatum. *Desv.*

The Specimen figured is from the Khasya Hills; but is not in fructification.

Hab. Nepal Mountains, Khasya Hills, Europe, Brazil, Martinique, Mexico, Vera Cruz, Xalapa, Tabasco, Esmeraldas, Sandwich Islands, Owhyhee, Oahu, Madeira, Azores, Teneriffe.

PLATE No. CLXXXI.

Trichomanes radicans
(Sw)

Transit Moorte

Govindie Del.

Lith. C.V.

TRICHOMANES.

TRICHOMANES DISSECTUM. (J. Sm.) Caudex long creeping stout setose, fronds erect rigid black when dry, scarcely stipulate lanceolate pinnate, pinnæ petiolate semi-ovato-lanceolate obliquely cuneate at the base inciso-pinnatifid segments variously toothed, unequal, oblong or linear, fertile ones often much contracted, involucres terminal on the segments or supra-axillary, urceolato-cylindrical, copious, receptacle exserted very long. *Hook. Sp. Fil.* 1. *p.* 140; *J. Sm. Ex. Fil. Philipp.*

The Specimen figured is from the Khasya Hills.

Hab. Khasya Hills, Luzon.

PLATE No. CLXXXII.

Trichomanes dissectum

(J. Sm:)

Gavendes Del.

Transf. Moorlo

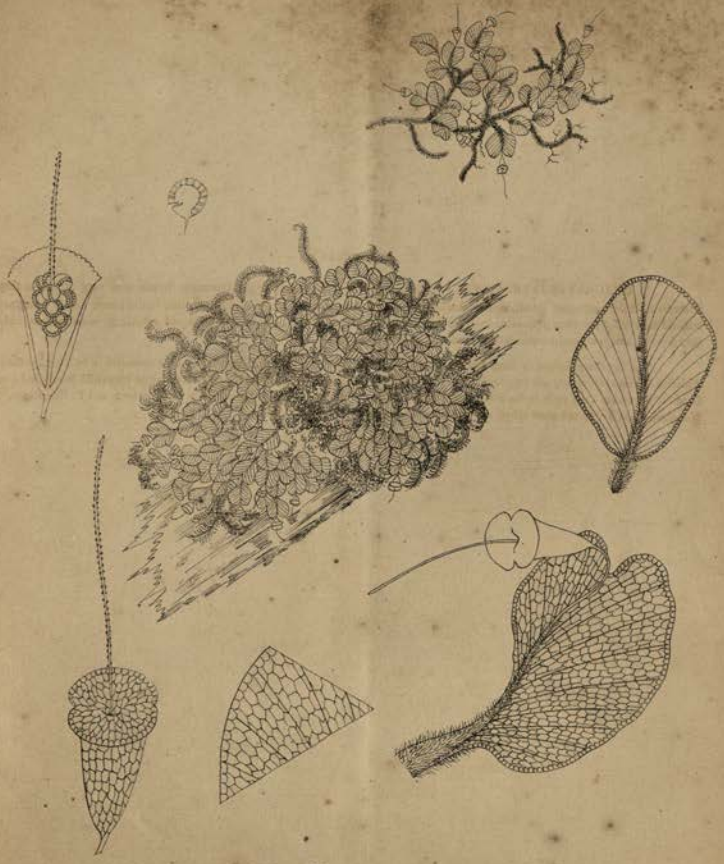
Lith. C.V.

TRICHOMANES.

TRICHOMANES HENZAIENSE. (Hook.) Caudex creeping more or less tomentose, fronds small very various in shape linear to orbicular and often lobed, membranaceous glabrous, stipes hairy very short or often obsolete, fertile fronds deeply emarginate with a long stalked involucre proceeding from the base of the sinus, the lips of its mouth very large and spreading, veins pinnate, and a very distinct marginal band of reticulations round the edge of the frond.

The Specimen figured is from Burmah (Parish). Mr. Parish forwards specimens of what he considers to be 2 or 3 different varieties of this species, they are very unlike the form here figured, having flabellate and in some cases deeply pinnatifid fronds and some have the involucres quite sunk in the frond, if Mr. Parish is correct in his supposition the species is most protean, and T. Henzaiense. T. Neilgherrense (*Bedd.*) and some others are probably only varieties of T. muscoides, *Sw.*

PLATE No. CLXXXIII.



Trichomanes Henzaiense
(Hook)

Govindoo Del:

Transf. Moorlie

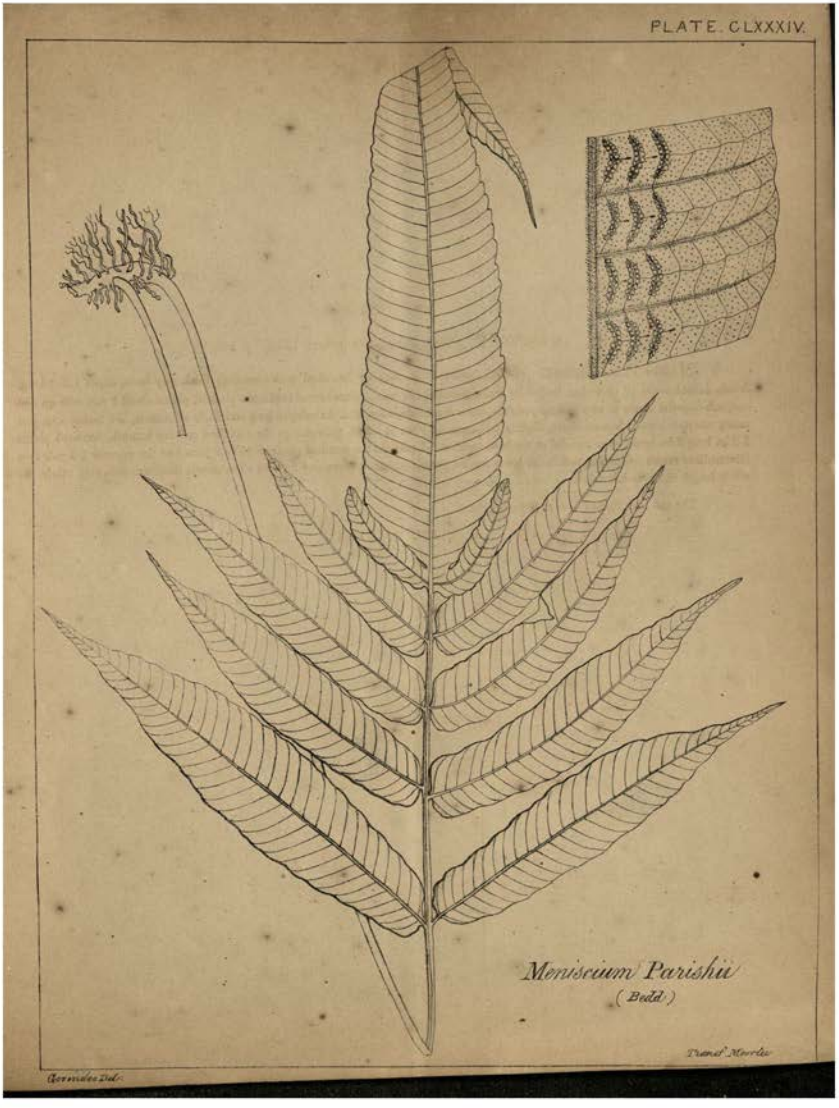
Lith. C. Nemcatrayalos Bajo

MENISCIUM. (See "Ferns of Southern India," p. 19.)

MENISCIUM PARISHII. (Bedd.) Caudex thick creeping furnished with numerous thick wiry roots, stipes 1 foot long, fronds deltoid-ovate 10-12 inches long 8-10 inches broad at the base, coriaceo-membranaceous pinnate, pinnæ about 4 pair with an odd one, sub-opposite sessile or very shortly petiolate, linear-lanceolate, sinuate at the margin, long and finely acuminate, 3-5 inches long ½ to nearly one inch broad, glabrous above, slightly pubescent (or often at length glabrous) on the costa and costules beneath, terminal pinnæ 7-8 in. long 2 in. broad often auricled at the base, veinlets 5-7 pair (in the terminal pinnæ 8-10) all joined or the superior 1-2 pair free intermediate venule free and clavate in the lower areoles, generally joined above and forming a continuous line, sori occupying nearly the whole length of the arched veinlets.

The specimen figured is from Burmah (Parish.)

PLATE No. CLXXXIV.


Meniscium Parishii
(Bedd.)
Transf. Moorlie
Govindee Del.

Order. MARATTIACEÆ.

(2) *Sori circular distinct; spore cases concrete in a single annular series.*—KAULFUSSINEÆ.

KAULFUSSIA. *Blume Enum, Fil. Jav.* 260.

(Macrostoma *Hooker M. S.* Aspidii Sp. *auct.*)

Gen. char. Sori dorsal, non-indusiate, sessile, globose, fleshy-coriaceous, concavo-hemispherical, crenate, consisting of 10-20 spore cases arranged in a single sessile concrete series; the spore cases bursting on the inner face, by a vertical oblong or linear-obovate cleft or slit. *Receptacles* globose compital. *Veins* prominent pinnate; venules anastomosing in hexagonal areoles, sori ferous on the points of confluence, the ultimate areoles containing free clavate veinlets.

Fronds coarse ternate, the under surface furnishes copiously with cavities which are probably secretory organs. Rhizome thick & decumbent. (Moore.)

KAULFUSSIA ASSAMICA. (Griff.) fronds 3-foliate, leaflets sessile, stipes terete, spore cases about 20, only opening on the inner face about half their length.

The figure is taken from Hooker's journ: of Bot. ii. 375 and shows no free veinlets in the areoles which is probably a mistake as is my specimens of K: osculifolia Bl: an allied species from Java they are always present.

Hab. Upper Assam.

PLATE No. CLXXXV.

Kaulfussia Assamica
(Griff.)

Trimel Moorlee

Govindra Del.

Litho C. Venkatesaya Regis

TRIBE CYATHEINEÆ.

MATONIA. *Br: Wall. Pl: Asiat. Rav.* 1. 16. *t.* 16.

(Prionopteris Wallich.)

Gen. char. Sori indusiate globose, situated at the posterior base of the segments and consisting of 6-7 sessile spore cases, the *receptacles* compital, i. e. produced at the point of confluence of several (obscure) anastomosing venules. *Indusium* indistinctly 6-7 lobed umbonato-hemispherical attached by an axile petiole, round the base of which the spore cases are inserted, its lower margin much incurved so as to enclose the sori in the manner of an inverted reflexed cup. Veins forked from a central costa, anastomosing where fertile otherwise free.

Fronds fan-like conjugato-sub-pedately flabellate, the pinnæ produced on the anterior or upper side of the divergent branches rigid linear pinnatifid nearly to the costa glabrous often glaucous beneath one or two feet long, 1-1½ foot wide, stipes slender 6 to 8 feet high. Rhizome creeping.

A genus consisting of a single species.

MATONIA PECTINATA R. Br. *Hook. sp. Fil.* v. 285. Prionopteris Farquhariana. *Wallich.*

The specimen figured is from Mount Ophir.

Hab. Summit of Mount Ophir (Malacca.)

PLATE No. CLXXXVI.

Matonia pectinata
(R. Br.)

Trans. Moorhei

Govindon Del.

Litho C. Vincentius Sc. Lyon

OSMUNDINEÆ.

OSMUNDA. (See "Ferns of Southern India," p. 26.)

OSMUNDA CLAYTONIANA: (L.) Fronds 1-3 feet long 4-8 inches wide, pinnate, rachis furnished with wooly hair which is more or less deciduous, pinnæ alternate or opposite sessile 2-3 inches long ½ to 1 inch broad, pinnatifid nearly to the costa segments about ½ an inch long, very obtuse, gradually smaller toward the apex of the pinnæ; some of the central pinnæ transformed, wholly or partially sporangiferous. Osmunda interrupta. *Mich.*

The specimen figured is from the Khasya Hills.

Hab. The Himalayas, Khasya Hills.

PLATE No. CLXXXVII.

Osmunda Claytoniana
(Linn.)

POLYPODIUM. (See "Ferns of Southern India," p. 55.)

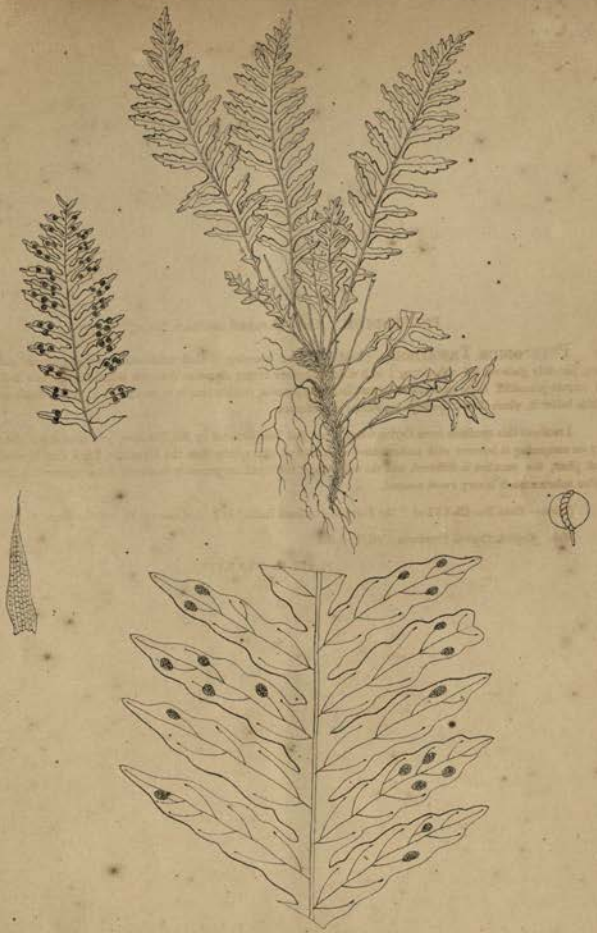
POLYPODIUM THWAITESII. (Bedd.) Caudex creeping, clothed with lanceolate scales, fronds sessile rigidly membranaceous, perfectly glabrous 2-4 inches long 1 inch wide, lanceolate deeply almost to the costa pinnatifid segments 3-6 lines long 1-2 lines broad sinuato-pinnatifid lower ones gradually smaller, veins pinnate, veinlets simple or rarely forked, where simple soriferous at the apex or a little below it, where forked the superior veinlet is soriferous.

I received this specimen from Ceylon where it has just been detected by Mr. Thwaites, who considers it the true P. parvulum of Bory ; on comparing it however with authenticated specimens of that species from the Mauritius, I find that it wants the warty stipes of that plant, the venation is different, and the segments of the frond are generally distinctly sinuato-pinnatifid instead of entire. Mr. Thwaites informs me it is very sweet scented.

(Note.—Plate No. CLXVI of "the Ferns of Southern India," is P. subfalcatum Bl. but the description that of P. parvulum).

Hab. Ceylon, Central Provinces. (C. P. 3,900.)

PLATE No. CLXXXVIII.



Polypodium Thwaitesii.

(Bedd)

Trans. of Mintie

Arvindio Del.

Lith. C. Bernatzky & Co. Regia

POLYPODIUM.

POLYPODIUM SUBFALCATUM. (Bl.) Caudex small, obliquely erect crinite rather than paleaceous, stipites short 3-8 lines long patenti-pilose, fronds firm-membranaceous hairy on both sides, or sometimes sub-glabrous beneath, 6-8 inches long 1-1½ inch broad, oblong-lanceolate subacuminate attenuated below deeply almost to the rachis pinnatifid, segments horizontally patent from a rather broad and decurrent base, linear lanceolate acute strongly serrated or pinnatifido-serrate, or slightly sinuate only, (sub-entire), lower ones remote distinct smaller than the rest, costule slender flexuose, veins evident distant simple oblique soriferous at the apex, sori small globose. *Hook. Sp. Fil.* iv. *p.* 193 ; *Bl. Fil. Jav. p.* 186 ; P. filipendulifolium ;—*Fée. Gen. Fil. p.* 240 ;—Variety *β* ;—glabrum, fronds glabrous beneath except on the costa, segments slightly sinuate or sub-entire.

The two varieties here figured have just been forwarded to me from Ceylon by Mr. Thwaites who refers them I think correctly to P. subfalcatum (Blume), the more hairy variety has already been figured in "the Ferns of Southern India," Plate No. CLXVI, but incorrectly named P. parvulum (which species has a creeping caudex). The fern figured at Plate LXXVI of this work as P. subfalcatum, has the veins soriferous in the middle, and is probably an undescribed species although the description accompanying the Plate refers to P. subfalcatum.

Hab. Ceylon, Anamallay Hills, (S. India) Java, Luzon, Nepal, Kumaon (alt. 8,500 feet) Sikkim, Himalayas.

PLATE No. CLXXXIX.

Polypodium Subfalcatum
(Bl.)

Drawn. Mentis.

Arvindo Del.

Lith. C. Vincent & Co. Rojas.

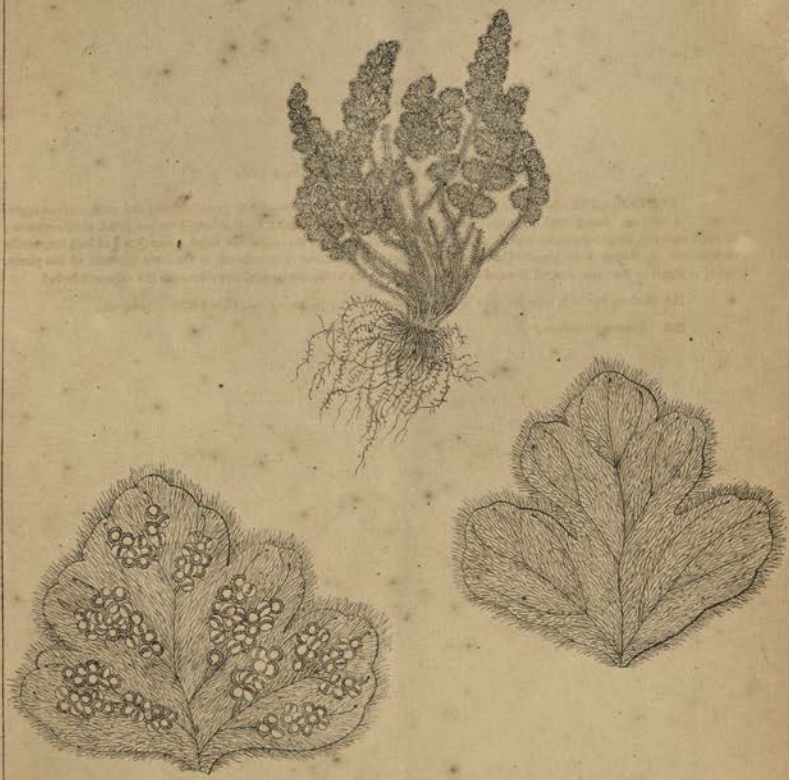
GYMNOGRAMMA, (See "Ferns of Southern India," p. 77.)

GYMNOGRAMMA ANDERSONII (Bedd.) Caudex subrepent furnished with numerous black airy roots, stipites aggregated 1-2 inches long, shaggy with long soft golden hairs, fronds (including stipes) 1-4 inches long, ½ an inch broad, membranaceous, pinnated copiously, strigose especially beneath with similar hairs to those on the stipes and rachis, pinnæ ¼ to ½ an inch long sessile cordato-ovate or oblongo-ovate pinnatifid or crenated, costa not very prominent veins pinnate in the lower segments of the pinnæ, forked or simple in the upper ones, all free and terminating considerably within the margin, sori copious on the veins and forked.

The specimen figured is from dry rocks in the Soondadunga valley (Kumaon) elev. 13,000 ft. (Dr. Anderson.)

Hab. Kumaon (Himalaya.)

PLATE No. CXC.



Gymnogramma Andersonii
(Bedd)

Transt. Moorlu

Jennings Del.

Lith. C. Vincatrayalos Rajoo

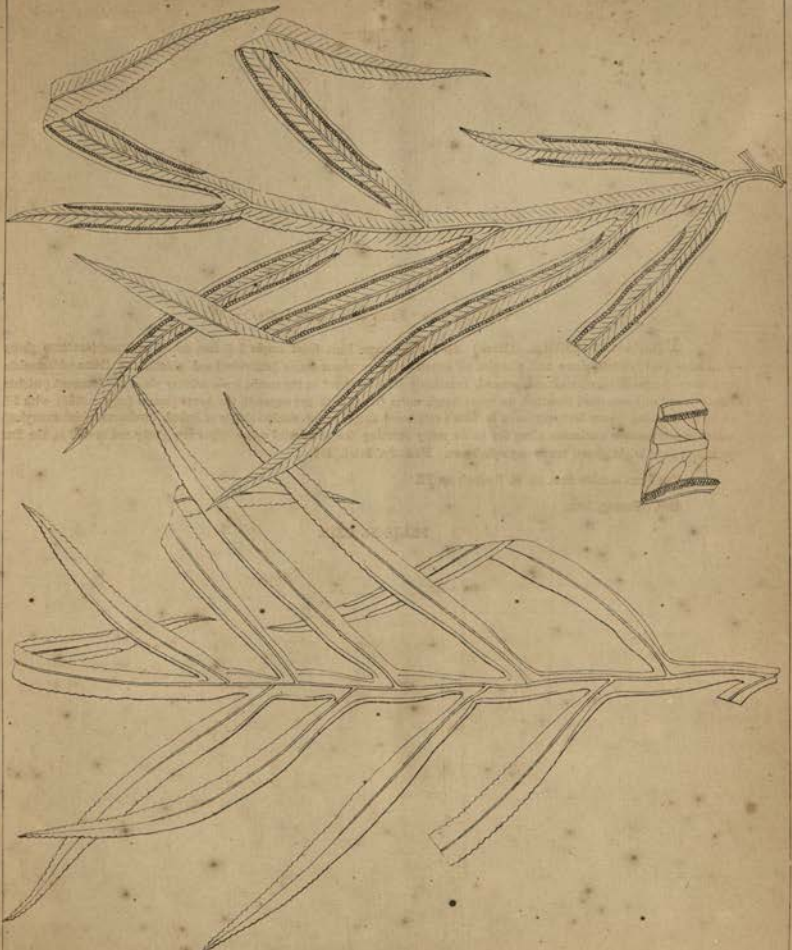
PTERIS. (See "Ferns of Southern India," p. 11.)

PTERIS DALHOUSLÆ. (Hook.) 2-3 feet and more high, frond ample 1-2 feet, subcoriaceo-membranaceous glossy bi-tri-below quadripinnate, pinnæ and pinnules all remote, superior pinnæ simple (undivided) and pinnules all linear-sublanceolate very much elongated acuminated and serrated, remarkably alato-decurrent on the rachis, lower primary pinnæ not decurrent petiolate falcate (lowest pair sometimes bipartite), the upper margin entire (rarely with one segment), the lower pinnate (or pinnatifid) with 5-6 (more or less) long pinnæ decurrent so as to form a very broad winged rachis, veinlets simple or forked, involucres subintramarginal, narrow membranaceous continuous along the rachis rarely reaching the acuminated apices, stipes very glossy and as well as the firm prominent costa bright glossy, tawny or purple-brown. *Hook. Sp. Fil.* ii. 170.

The figure is taken from Sir W. Hooker's Sp. Fil.

Hab. Penang, Java.

PLATE No. CXCI.



Pteris Dalhousiæ
(*Hook*)

Transf. Hunter

Sowerby Del.

Litho C. Vincent Regales Paper

§ 1. ACROSTICHEÆ.

(a) fronds wholly fertile.

* *Veins free.*

LOMARIOPSIS. *Fée. Hist. Acrost,* 10.

(Acrostichi Sp. *Auct.*; Lomarieæ Sp. *Auct.*; Stenochlæneæ Sp. *J. Sm.*; Olfersieæ Sp. *Presl.*; Onocleæ Sp. *Auct.*; Anemieæ Sp. *Sprengel*; Osmundæ Sp. *Bory.*)

Gen. char. *Sori* superficial, non-indusiate, the *receptacles* occupying the under surface of the contracted fertile fronds. *Veins* simple or parallelo-furcate from a central costa. *Vennles* free.

Fronds dimorphous, pinnate, the fertile contracted. Rhizome scandent. This genus differs from Stenochlæna, with which it agrees in habit, in the absence of the costal areole, and of the gland on the margin of the pinnæ near the base. (Moore.)

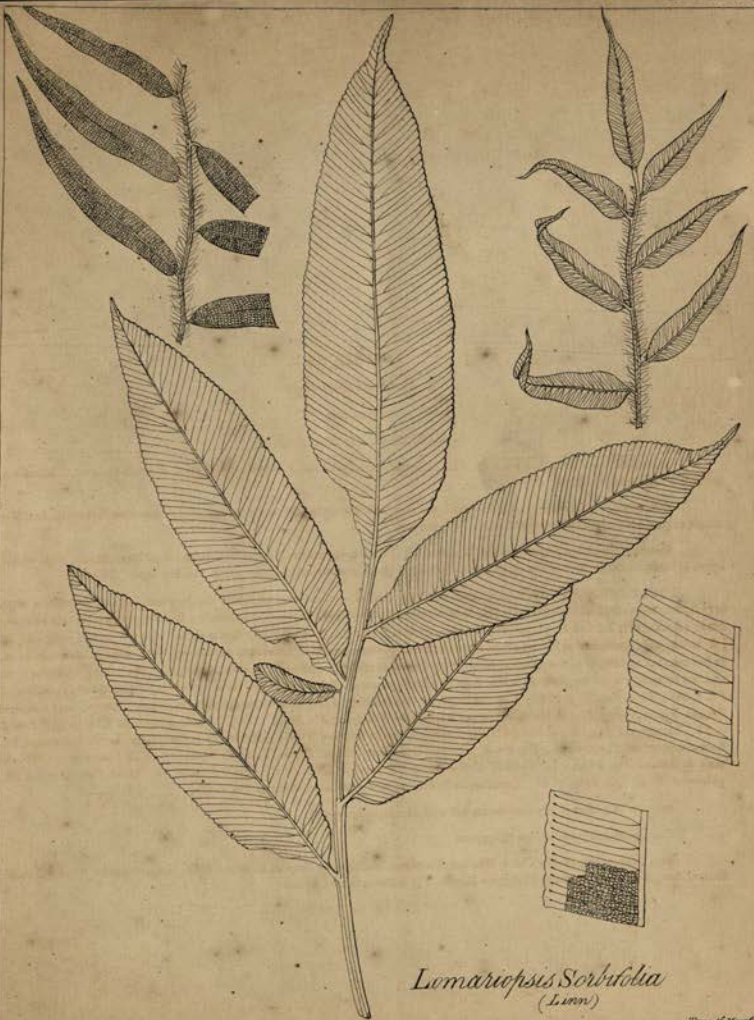
LOMARIOPSIS SORBIFOLIA (Linn.) Caudex long thick scandent often angled by the decurrent bases of the stipites clothed large lanceolato-subulate ciliated generally pale fuscous scales, stipites varying in length 3 inches to a foot long more sparingly paleaceous, fronds subcoriaceous 1-2 feet long lanceolate or oblong pinnated, pinnæ articulated 6-30; sterile pinnæ from 4-7 inches long and from ¾-2 inches wide lanceolate or oblong acuminate sometimes broader upwards or sometimes caudato-apiculate subpetiolate entire or more or less serrated or dentate at the margins, rachis winged towards the apex and even for its whole length in the young specimens, veins manifest extending to the margin more or less elevated; fertile pinnæ smaller and narrower, veins terminating within the margin. *Hook. Sp. Fil.* v. 242; *Linn. Sp. Pl.* p. 1526; Lomaria longifolia and sorbifolia *Kfs.*; Stenochlæna longifolia *J. Sm.*; Acrostichum lomarioides *Bory in Belang. Voy.* p. 21 *t.* 2. (pinnules obtuse); Lomariopsis Boryana *Fée Acrost.* p. 68; Lomaria integrifolia Klfs. in *Sieb. Syn. Fil.* n. 23. Lomariopsis cuspidata et variabilis *Fée Acrost.*; Lomaria fraxinea *Willd*; Lomariopsis ludens. *Fée Acrost.* (abnormal form) Lomaria recurvata et leptocarpa. *Fée Acrost.*; Stenochlæna oleandrifolia. *Brack Fil. U. S. Expl. Exp.* p. 75, Lomariopsis Cochinchinensia et Smithii *Fée Acrost*; L. Wrightii *Mett.*—Acrost. Yapurense *Mart. Ic. Pl. Crypt. Bras.* p. 36. *Hook. Gard. Ferns t.* 57, et phlebodes *Kze on Linnæa* ix. p. 33. Lomariopsis Prieuriana et erythrodes et elongata *Fée Acrost.*

A genus of probably only one species but with numerous synonyms.

The Specimen figured is from Singapore.

Hab. Singapore, Cochin China, Bourbon, Mauritius, Madagascar, Tropical America, West Indian Islands, Cuba, Columbia, Guiana, Peru, &c., Tropical Africa, Philippine Islands, Fiji Islands, Samoa, Luzon.

PLATE No. CXCII.



Lomariopsis Sorbifolia
(Linn)

Trandt Murtle

Govindoo Del.

Lith. O. Vinnalsay ales Rajee

ASPLENIUM. (See "Ferns of Southern India," p. 43.)

ASPLENIUM ZAMIOIDES. (Hook.) Stipes and rachis deciduously scaly compressed and sulcated, frond a foot and more long oblong acuminate firm coriaceo-membranaceous opaque (probably very succulent when fresh) impari-pinnate, pinnæ 14-17 horizontally patent dimidiato-ovate sometimes subfalcate obtuse or obtusely acuminate 2½-3 inches long quite entire, the base obliquely cuneate and tapering into a very short petiole, superior extended, sometimes forming an obtuse angle or imperfect auricle, terminal pinna the largest elliptical-ovate with a more or less distinct lobe on one side, veins sunk subflabellate especially near the base erecto-patent twice or more forked distant, costa indistinct sori elongated almost parallel with the obscure costa often interrupted sometimes an inch long and extending to the margin costa stout compressed. *Hook Sp. Fil.* iii. 114,

The figure is taken from Sir W. Hooker's Sp. Fil.

Hab. Penang.

PLATE No. CXCIII.

Asplenium Zamioides.
(Hook.)

Geoindes Del.

Daniel Mintz

Lith. C. Vincenzo Zaffo Sgro.

ASPLENIUM.

ASPLENIUM HIRTUM. (Klfs.) Caudex short thick woody scarcely creeping densely clothed with subulate black fringed hair-like scales which are continued on the stipes and rachis and partially on the costæ beneath where they become patent at length deciduous, stipites subcæspitose a span to a foot and more long dull lurid-blackish rather stout, fronds 1½ to 2 and more feet long lanceolate acuminate coriaceous or stout-chartaceous very opaque brown, pinnatifid, pinnæ numerous approximate lowest ones small remote sessile horizontal, supreme ones gradually smaller and terminating in a pinnatifid acumen, the rest 1-3 inches long lanceolate obtuse or acuminate generally strongly serrated, serratures sometimes unequally bi-tridentate, the superior base truncated and with a more or less distinct auricle, inferior base more or less excised (never auricled) veins erecto-patent simple or once or twice forked, sori copious linear regular nearer the costa than the margin, involucres narrow very firm and rigid brown sometimes black. *Hook. Sp. Fil.* iii. p. 149; *Kaulfs En. Fil.* p. 169; A. pellucidum *Lam. Encycl.* ii. p. 306; A. stenopteris *Kze. in Bot. Zeit.* vi. p. 174? A. acutinsculum *Bl. En. Fil. Jav.* p. 178 ? A. approximatum *Bl. En. Fil. Jav.* p. 179; A. Torresianum *Gaud. in Freyc. Voy.* p. 317; A. Meyenianum *Presl;* A plumosum *Bory;* A. Helsinbergii *Sieb. Fl. Mirt. n.* 316.

The figure is taken from Sir W. Hooker's Sp. Fil. Nearly allied to A. longissimum but differing in having the caudex and stipes furnished with black scaly hairs and in the base of the pinnæ only being auricled at the superior base.

Hab. Burmah (Parish) Penang, Guahan Island, Solomon Island, Java, Madagascar, Borne, Luzon, Mauritius, Bourbon.

PLATE No. CXCIV.

Asplenium hirtum
(Kavlfs)

Trans. Morrles

Govindor Del.

Lith. C. Vercelrogalos Regn.

DIPLAZIUM. (See "Ferns of Southern India.")

DIPLAZIUM TOMENTOSUM. (Mett.) Caudex small tortuous knotty scaly above sending down numerous wiry branched roots, stipites tufted 4-5 inches to a span long hispid especially towards the base with subulate blackish-brown scales, fronds 6-10 inches long firm-coriaceous oblong-ovate acuminate pinnate, pinnatifid at the apex, pinnæ approximate 1½-2½ inches long ½-¾ of an inch wide sessile from an obliquely truncated auriculated base linear-oblong acute rarely subfalcate pinnatifid about half way down to the rachis, segments acute subfalcate entire, or slightly sinuate and toothed at the apex, lower pairs of pinnæ reflexed superior one serrated, segments of the acumen toothed at the apex, veins pinnated on each lobe or segment simple or one-forked, sori few 1-4 in each segment often diplazioid, involucres brown, membrane erose at the margin. *Hook. Sp. Fil.* iii. 249; *Mett. Asplen.* p. 182. (excl. syn.).—Diplazium *Bl. En. Fil. Jav.* p. 192. Asplenium argutum. *Fée in* 8 *me Mém.* p. 53. *t.* 24. p. 192; A. marginatum *Wall. Cat. n.* 2204 *and* 2209 (*according to Mettenius and Moore.*)

The Specimen figured is from Burmah (Parish) when fresh it has quite a pale metallic lustre, which is lost in drying.

Hab. Burmah, Mergui, Java, Malacca, Khasya.

PLATE No. CXCV.

PLATE. CXCV.

Diplazium tomentosum
(Mitt.)

Gerrinder Del. Trant Moorlie Lith. v. Vrevenhagen Regis.

LASTREA.

LASTREA ANGUSTIFRONS. (Moore M. S.) Rhizome wide creeping, stem 1-2 feet long, ebenous, deciduously scaly, frond 2 feet long, 6-8 inch wide, tripinnatifid, pinnæ distant, erecto-patent lanceolate flexuose, 4-6 inch long, 2 inch broad, pinnules distant, lanceolate, the lower ones cut down to the rachis into subquadrangular deeply-toothed lobes ⅛ inch broad, texture subcoriaceous, rachises and both surfaces naked, veinlets of the lobes forked, sori in rows close to the midrib of the pinnules. Lastrea splendens var. β, angustifrons. *Hook. Sp. Fil.* iv. 126, *and page 42 of this work.*

The specimen figured is from Nepaul—(Wallich).

Hab. Nepaul.

PLATE No. CCXXVI.

Lastrea angustifrons.

Moore

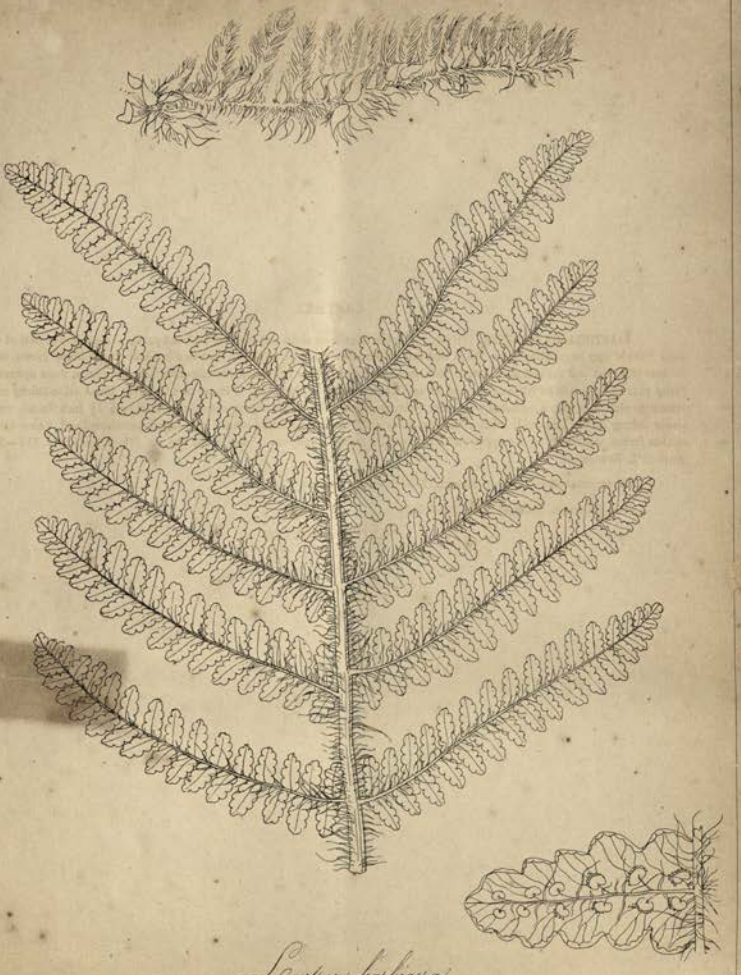
LASTREA.

LASTREA BARBIGERA. (Hook.) Caudex stout erect short and together with the young nascent fronds clothed with a dense mass of very large satiny scales mixed with soft golden and silky hairs, stipites a span to a foot long, stout black brown only at the base (the rest and the rachises) clothed with large satiny scales ovate and acuminate mixed with narrower ones, those upwards gradually pass into rich golden soft hair-like and flexuose scales, fronds 1½-2 feet long, 10 inches to a foot wide, broad ovate-oblong scarcely acuminate pinnate or almost universally bipinnate, primary pinnæ subpetiolate oblong obtuse 4-5 inches long, 1½ inch broad, pinnules sessile oblong deeply pinnatifid, lobules strongly dentate, the teeth divaricating with a very sharply-acuminated and setaceous point, veinlets forked, sori mostly on the upper half of the frond as many as there are lobules to the pinnule. Hook. Sp. Fil. iv. 113—Nearly allied to L. Brunoniana.

The specimen figured is from Sikkim, 12000 ft.—(Dr. Hooker).

Hab. Kumaon, Simla, Sikkim 12-13000 ft.

PLATE No. CCXXVII.



Lastrea barbigera (Hook.)

J. BAKER DEL.

LITHOG. AT THE POSTER PRESS MADRAS 1867

LASTREA.

LASTREA PLATYPUS. (Hook.) Caudex ? stipes in the upper part terete testaceous glabrous slender, frond 1½ foot long, thin coriaceous glossy sub-deltoideo-ovate acuminate bipinnate tripinnate below, primary pinnæ 6-10 inches long petiolate, superior ones ovato-oblong acuminate subfalcate ; based ones the longest and bipinnate, pinnæ and ultimate pinnules all obliquely ovate acuminate at the base, superior base auricled, the rest sub-pinnatifid with pungent and serrated lobes, veinlets twice or thrice forked, sori in 2 series half-way between the costule and the margin, involucre large convex cordato-reniform membranaceous finely fimbriated on a short stipes.—*Hook. Sp. Fil.* iv. 149 ;—Aspidium ;—*Kze. Bot. Zeit.* vi. p. 262 ;—*Mett. Asp.* p. 69.

The specimen figured is from Moulmein—(Lobb.)

Hab. Moulmein Mountains, 5000 ft., Java.

PLATE No. CCXXVIII.

Lastrea platypus (Hook.)

C. COVINGTON, DEL.

LITHOG. AT THE FOSTER PRESS, HOBART.

POLYPODIUM.

POLYPODIUM SUBDIGITATUM. (Bl.) Caudex slender, suberect flexuose scaleless, radicant with wiry fibres, terminated by a tuft of scaly stramineous stipites a span to a foot and more high, fronds 1-2 feet high, ovate acuminate firm membranaceous quadripinnate, primary secondary and tertiary pinnæ petiolate, ultimate ones ovate cuneate and subpetiolulate at the base, about ¼ of an inch long, pinnatifid with few oblongo-obovate, obtuse segments, pinnate at the base, the ultimate pinnule broader than the segments and lobed, veins and simple or forked veinlets subflexuose terminating below the apex of a lobe and there bearing the rather small globose sorus ;—*Hook. Sp. Fil.* iv. 256 ;—*Bl. Fil. Jav.* p. 196. *t.* 93 ;—Polypodium davallioides. *Mett. Polyp.* p. 32 ;—*Hook. Sp. Fil.* iv. 256 ; Monachosorum ;—*Kze. in Schk. Fil. Suppl.* ii. p. 1. *t.* 101 ;—Polypodium coniifolium. *Wall. Cat. n.* 326.

There are clusters of tuberiform excrescences in the axils of the pinnæ, which Sir W. Hooker considers may be gemmæ or viviparous buds, or possibly fungi.

The specimen figured (a lower pinna) is from Sikkim—(Dr. Hooker.)

Hab. Nepal, Sikkim 7—8000 ft., Bhotan, Malay Islands, 3—7000 ft., Java, Malay Penins.

PLATE No. CCXXIX.

Polypodium subdigitatum

(Bl.)

C. LOVINGOOD DEL.

LITHOG. AT THE FOSTER PRESS, MADRAS 1867

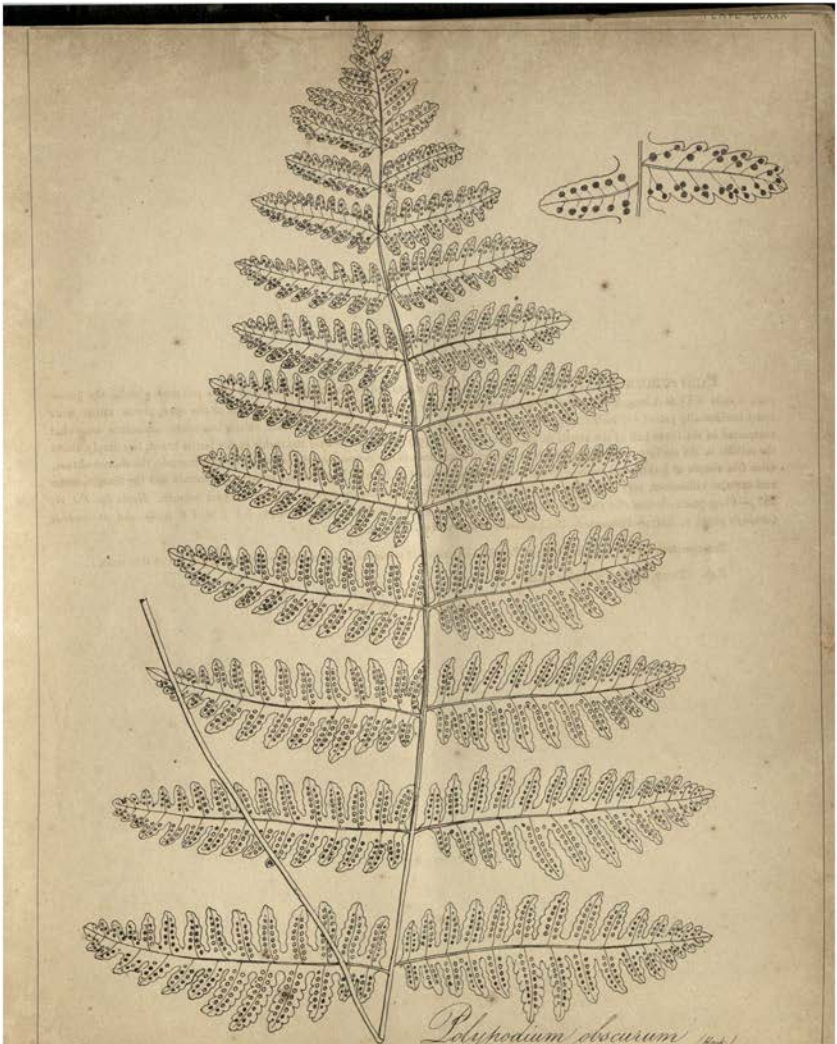
POLYPODIUM.

POLYPODIUM OBSCURUM. (Hook.) Caudex? stipes and rachis intensely ebenous-black polished glandularly pubescent, fronds 1-1½ foot long, 6-10 inches broad, submembranaceous ovate acuminate pinnate pinnatifid at the apex, pinnæ rather wide apart horizontally patent 4-5 inches long, ¾ (in the fertile frond), 1 inch (in the sterile) broad, oblong-lanceolate acuminate somewhat contracted in the lower half of the sterile frond, uniformly and deeply pinnatifid to near the rachis in the fertile frond, less deeply above the middle in the sterile one where the pinnæ is broadest, segments oblong obtuse scarcely falcate entire or subserrate, the sinuses obtuse, veins free simple or forked, sori copious dorsal or sometimes terminal in 2 series intermediate between the costule and the margin, costæ and costules villosulous, very slender in the sterile plant, stouter in the fertile, the former black at the base beneath. *Hook. Sp. Fil.* iv. 237;—Phegopteris obscure *Fée. Gen. Fil.*;—Stenosemia aurita. *J. Sm. in Hook. Gen. Fil. t.* 94. *f. i. 5 and* 6 (*only and as regards Cuming's plant, n.* 302);—Phegopteris Philippinensis *2nd* var. *Mett. Pheg.* p. 27.

The specimen figured is from Tavoy—(Parish)—in outline it is very similar to Lastrea melanopus (Pl. 38 of this work.)

Hab. Tavoy, Leyti, Philippine Islands.

PLATE No. CCXXX.


Polypodium obscurum (Hook.)

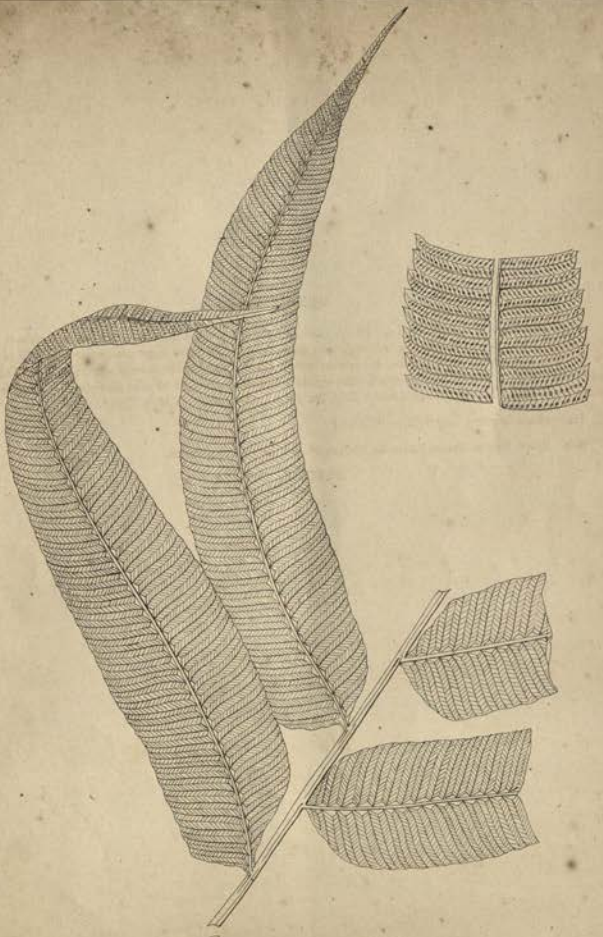
GONIOPTERIS.

GONIOPTERIS MULTILINEATA. (Wall.) Caudex ? stipes 2 feet and more long, stout glabrous as well as the rachis, frond about 3-4 feet long firm-coriaceous pale yellowish-green glabrous pinnated, pinnæ approximate numerous 8-15 inches long, 1-2 inches wide, from a truncated subsessile base, elongate moderately acuminated, the margin every where strongly and sharply serrated, costa and costules and even veinlets elevated on both sides especially beneath, veinlets 16-20 pairs close placed, nearly the whole of them connivent and soriferous in the middle and biserial. *Hook. Sp. Fil.* v. xi.—*Wallich. in Herb. Hook.*

The specimen figured is from Sylhet—(Wallich.)

Hab. Sylhet, Sikkim, Assam, Parasnath, Pandua, Bhotan, Gowhatty, Kumaon.

PLATE No. CCXXXI.



Goniopteris multilineata. (Wall.)

LITHOG. ASTON FOSTER PRESS.

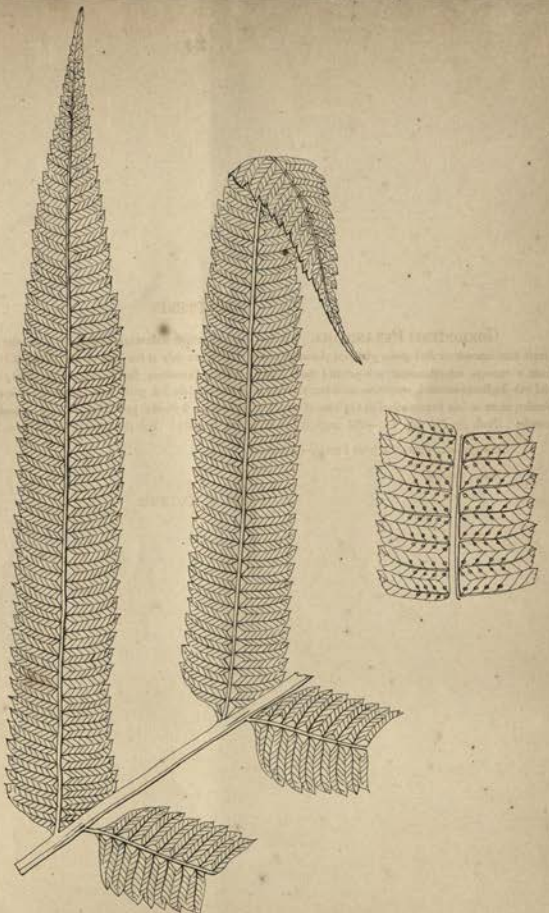
GONIOPTERIS.

GONIOPTERIS PENANGIANA. (Hook.) Caudex ? stipes and rachis moderately stout quite glabrous cinnamon-red, fronds ample membranaceous dark-green glabrous pinnated, pinnæ (8-10 pairs only of the base of the frond) 6-10 inches long, 1-1½ inch broad from a cuneate sub-attenuated sub-petioled base, elongato-oblong lanceolate finely acuminated coarsely and sharply sub-mucronately and sub-duplicato-serrated, serratures moderately patent uniform, veinlets 8-9, pairs very frequently alternate, spurious vein or costule slender, more or less flexuose, sori at the base of each veinlet forming 2 closely placed series only separated by the primary vein or costule. *Hook. Sp. Fil.* v. p. 13;—Pol. urophyllum, *Wall.* var. augusta ? Pol. lineatum; *Wall. Cat. n.* 299. 3.

The specimen figured is from Penang—(Wallich.)

Hab. Penang.

PLATE No. CCXXXII.



Goniopteris Penangiana (Hook.)

LITHOG. AT THE FOREIGN PRESS.

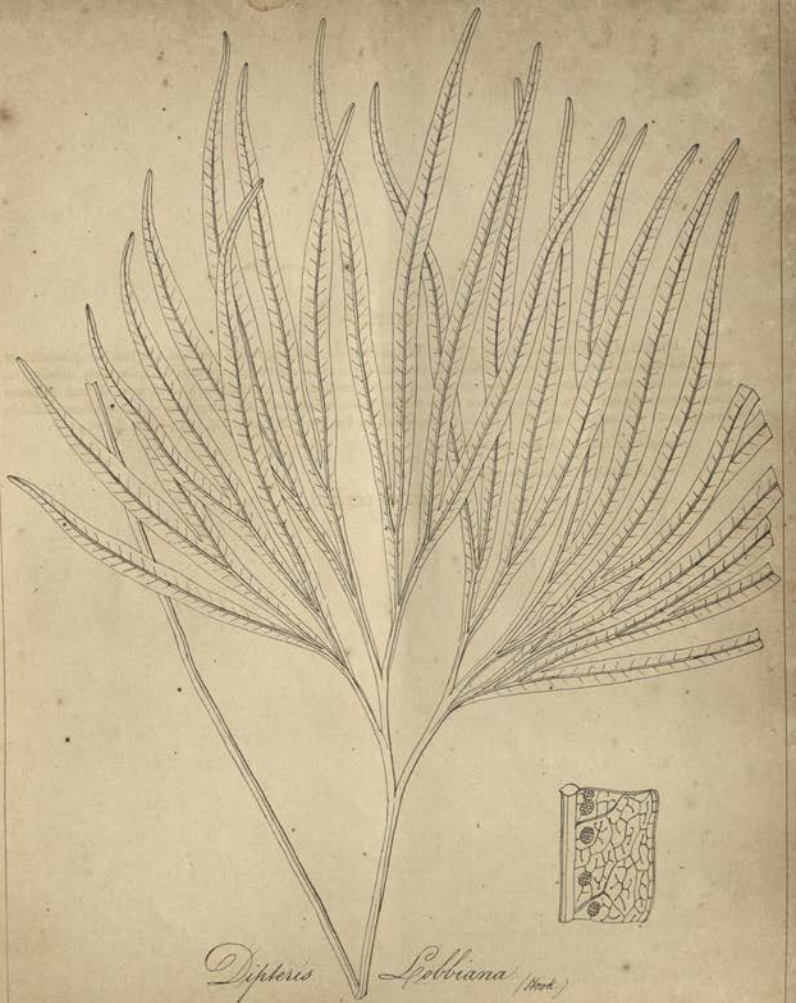
DIPTERIS.

DIPTERIS LOBBIANA. (Hook.) Caudex ? stipites 1 foot and more long, fronds coriaceous, 8-12 inches long, flabelliform glabrous, 3-4 times digitately dichotomous, dark brownish-green above, pale and tawny beneath, segments 4-8 inches long scarcely ½ an inch wide, linear-sublanceolate finely acuminated costate entire, venation manifest, the costules form a costal series of large sōriferous areoles, the rest of the veins unite, constituting lesser areoles and include free veinlets, sori 1-2 in each primary areole (sometimes confluent) in a single series very near the costa. *Hook. Sp. Fil.* v. 100;—*Hook. in Kew. Gard. Misc.* v. p. 300, *t.* xl.;—*Mett. Polyp.* p. 104.

The specimen figured is from Sarawak—(Lobb.)

Hab. Mount Ophir, Malacca, Sarawak, Borneo.

PLATE No. CCXXXIII.



Dipteris Lobbiana (Hook.)

C. GOVINDOO, DEL.

LITHOG. AT THE FERN PRESS. 1861.

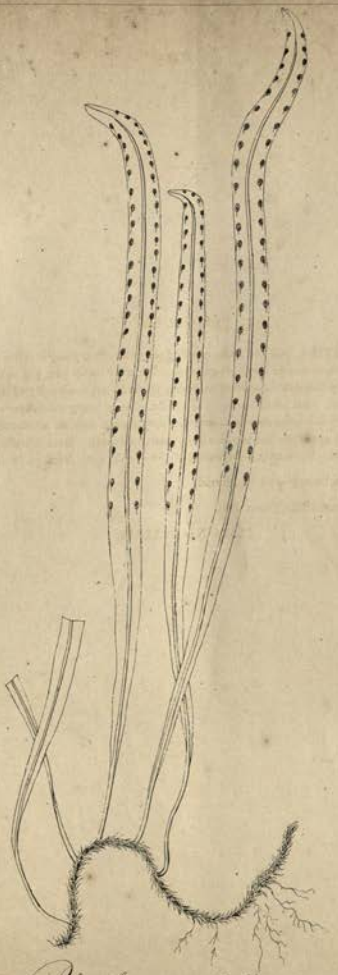
PLEOPELTIS.

PLEOPELTIS STENOPHYLLA. (Bl.) Caudex creeping paleaceous with glossy subulate pale imbricated ferruginous scales, stipites 1-2 inches long distant, fronds firm-coriaceous very rigid glabrous polished 4-9 inches long, ½-½ an inch wide linear-oblong obtuse, the margin thickened and subreflexed broadly crenato-sinuate rarely narrowing upwards, but much and gradually attenuated below on the stipes, costa prominent beneath, costules none, veins anastomosing so as to form oblong, hexagonal oblique areoles with rarely a free included veinlet, sori rather distant oval arranged in a series close to the margin, deeply sunk into the substance of the frond forming elevated pustules on the upper side one to each crenature, the margin of the cavity elevated. *Hook. Sp. Fil.* v. 65 ;—Bl. *Fil. Jav.* p. 135. *t.* 55. *f.* 1. *Mett. Polyp.* p. 99, *t.* 1. *f.* 31—34 *venation.* Drynaria ; *J. Sm.—Fée,* 6 *me, Mém.,* p. 18. *t.* 8. *f.* 3.

The specimen figured is from Penang—(Sir W. Norris.)

Hab. Penang, Malacca, Mount Ophir, Luzon, Java.

PLATE No. CCXXXIV.



Pleopeltis stenophylla (Bl.)

H. BAKER, DEL. LITHOG. AT THE PRETER PRESS, MADRAS.

ALSOPHILA.

Gen. char. (omitted by mistake at page 20, Ferns of Southern India.)

Sori naked, or sometimes spuriously (*i. e.* squamose) involucrate; the receptacles globose or columnar, medial or axillary. Involucre non-apparent or represented by a bullate scale, or a series of jointed hairs. Veins simple, forked, paralled-forked, or pinnate, from a central costa; veuules free, uniseriferous.

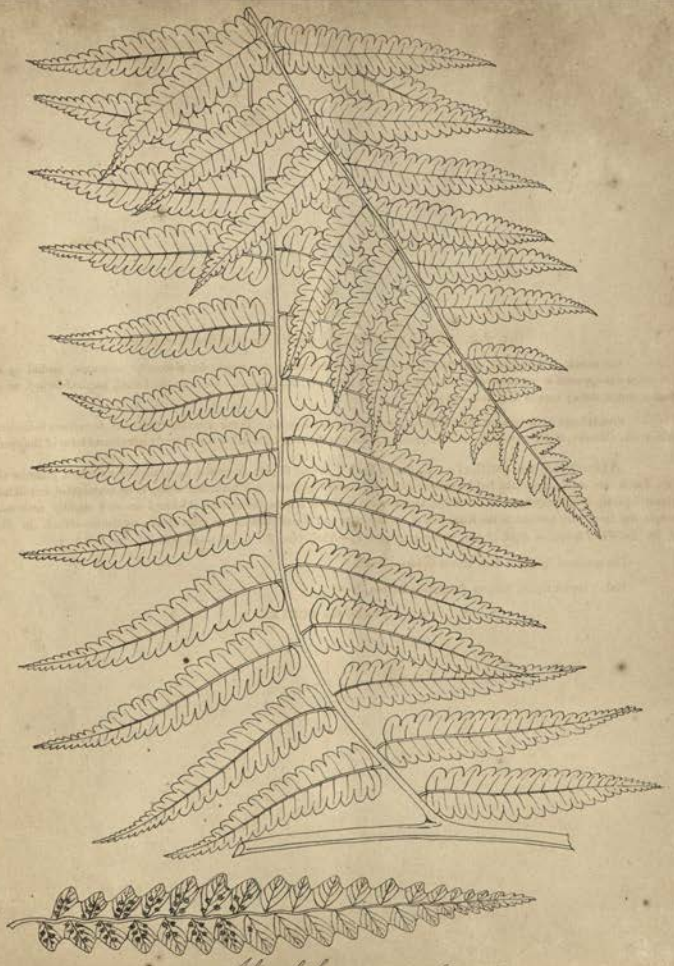
Fronds large, herbaceous or sub-coriaceous, bi-pinnate or decompound. Trunk or caudex thick erect, sometimes branching, often arborescent (Moore); this genus differs from Polypodium in its elevated receptacle and in the obliquely compressed form of the spore-cases.

ALSOPHILA SQUAMULATA. (J. Sm. et Hook.) Frond bi-pinnate, partial rachis slightly squamose, pinnules all petiolate, sterile ones oblong-lanceolate, fertile portions contracted coriaceous glossy as if varnished ending in an acuminated serrulated point pinnatifid scarcely half way down to the rachis, segments ovate obtuse serrate, the margins thickened or very slightly recurved, veins simple, sori frequently confined to the lower part of the pinnules and placed close to the costa of the segments.—*Hook. Sp. Fil.* 1-51. *J. Sm. En. Fil. Philipp. in Hook. Journ. of Bot. v.* iii. p. 419;—*Hook. Gen. Fil. t.* 100;—*Bl. En. Fil. Jav.* 243?

The specimen figured is from Mount Ophir—(Griffith.)

Hab. Mount Ophir, Malacca, Phillippine Islands, Java?

PLATE No. CCXXXV.



Alsophila squamulata (J. Sm. et Hook.)

C. DEVINDOO, DEL.

LITHOG. AT THE CASTLE PRESS, NEW

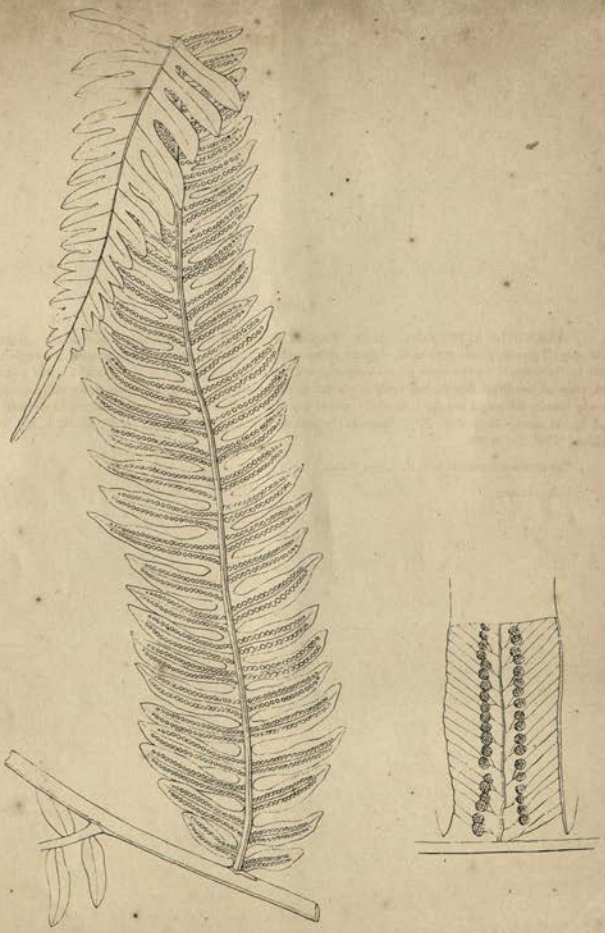
ALSOPHILA.

ALSOPHILA ALTERNANS. (Hook.) Unarmed or only with extremely minute distant tubercles on the base of the stipes fronds only (!) pinnate, pinnæ very remote, petiolate alternate oblong lanceolate membranaceo-coriaceous acuminated deeply pinnatifid almost to the rachis, at the base again pinnated, segments and pinnules oblong rounded at the apex with rather an acute point nearly entire, veins all free forked near the base rarely simple, sori on the veinlets above the fork, (seldom on the axil) copious, forming a series half way between the margin and the costa, each furnished with a little pellicular peltate scale (spuriously involucrate) covered and concealed by the sorus.—*Hook. Syn. Fil.*;—Hemitelia ! alternans. *Hook. Sp. Fil.* 1. *p.* 29. *Hook. Ic. Pl. v.* 7, *t.* 622;—Polypodium alternans. *Wall. Cat. n.* 329.

The specimen figured is from Penang—(Wallich.)

Hab. Penang.

PLATE No. CCXXXVI.



Alsophila alternans (Bock)

H. BAKER DEL.

LITHOG. AT THE TOPOGR. PRESS, MADRAS 1847.

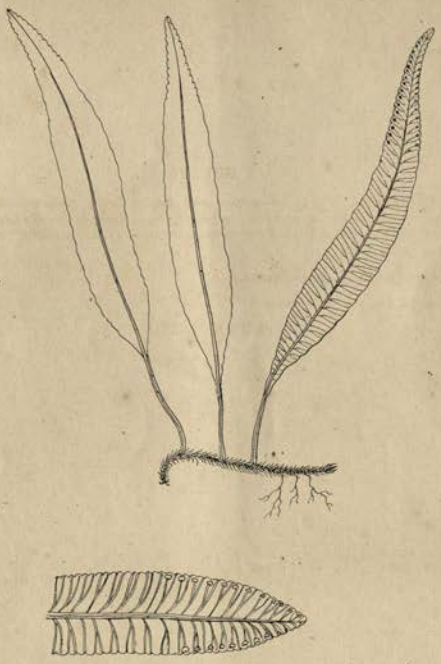
HUMATA.

HUMATA ANGUSTATA. (Wall.) Caudex rather stout creeping densely paleaceo-setose, fronds coriaceous lanceolate, arising from a scaly bulb entire or dentate acuminate, fertile ones generally much elongated, obscurely sinuato-dentate, veins all parallel simple or forked thickened, involucres small transversely oval, forming a single series along the margin. *Hook. Sp. Fil.* 1. 152. *Wall. Cat.* 242;—*Hook. et. Grev. Ic. Fil. t.* 231.

The specimen figured is from Singapore—(Wallich.)

Hab. Singapore (on trunks of trees), Penang.

PLATE No. CCXXXVII.



Humata angustata

(Wall.)

H. BAKER, DEL.

LITHOG. AT THE FOSTER PRESS, MADRAS, 1897

GYMNOGRAMMA.

GYMNOGRAMMA OPACA. (Spr.) Caudex ? stipites 1½ and more feet long, fronds 2 feet and more long, nearly a foot wide at base, subdeltoideo-ovate acute membranaceous, pubescent on the rachises and costæ bi-pinnate below, pinnate in the middle, pinnatifid at the apex, lower primary pinnæ petiolate 6 inches long 3 inches wide oblongo-ovate, their pinnules 1-1½ inch long less than ½ an inch wide, oblong sessile and adnate and slightly decurrent at the base, obtuse or acute lobato-pinnatifid, the lobes retuse or emarginate, intermediate primary pinnæ deeply pinnatifid sinnuato-serrate, veins fasciculato-pinnate, a fascide to each lobe of the pinnules or large segments, soriferous only at the base of the lower branches, sori oblong forked.—*Hook. Sp. Fil.* v. *p.* 143. Gymnogramma obtusata. *Bl. Fil. Jav. p.* 97. *t.* 43. *and Hook. Sp. Fil.* v. 143 ;—G. opaca *Spr.* ;—Phegopteris opaca, *Mett. Pheg. p.* 15 ;—Hemiomitis, *Don.* ;—Gymnog. arborescens, *De. Vriese. in Herb. Hook.*

The specimen figured is from Nepal—(Wallich.)

Hab. Nepal, Khasya, Java.

PLATE No. CCXXXVIII.

Gymnogramma opaca

(Spr.)

H. BAYER DEL.

LITHOG. AT THE VOGTER PRESS, MADRAS 1867

SELLIGUEA.

SELLIGUEA HAMILTONIANA. (Wall.) Caudex creeping, partially paleaceous with subulate black scales, stipites distant 2-4 inches long, in the sterile fronds a foot and more long, more slender in the fertile, fronds dimorphous, subcoriacco-membranaceous subopaque glabrous sinnato-dentate ovate or ovato-lanceolate, acuminate at the base long-attenuated and decurrent upon the stipes; sterile ones 5-18 inches long; fertile 3 rarely exceeding 5 inches long, primary veins costuliform flexuose horizontally patent distant, united by transverse veins forming large square areoles including several lesser ones which generally include free veinlets, sori copious, oblong continuous alternating with the costular veins equally long with them, at length confluent.—*Hook. Sp. Fil.* v. 161. *Wall Cat.* n. 9. *Pr. Teut. Pterid. p.* 216. *t.* 9. *f.* 16, *and* S. Hookeri. Presl. *l. c.*;—Ceterach pedunculata. *Hook. and Grev. Ic. Fil. t.* 5;—Selligues, *Presl. Epim. Bot. p.* 146.

The specimen figured is from Sylhet—(Wallich.)

Hab. Sylhet, Khasya, Mishmee.

PLATE No. CCXXXIX.

Selliquea Hamiltoniana

(Wall.)

A. BAKER, DEL.

LITHOG. AT THE FOSTER PRESS, WINDSOR, ENG.

SYNGRAMMA.

SYNGRAMMA ALISMŒFOLIA. (Hook.) Caudex creeping stipites a span to a foot and more long blackish-purple, fronds subcoriaceo-membranaceous, simple 5-8 inches long 2½ inches wide near the base, from a rounded base ovate or ovato-lanceolate, finely acuminated, veins numerous approximate simple or forked anastomosing only at the margin into 1-2 rarely more series of oblong hexagonal areoles, sori narrow-linear on all the straight veins but scarcely extending to the anastomosing ones. *Hook. Sp. Fil.* v. 155; *J. Sm. in Hook. Lond. Journ. Bot.* 1845, *p.* 168. *t.* 7, 8, *B. Pr. Epim. Bot. p.* 144;—Diplazium, Pr. Rel. Hoenk. 1. *p.* 49 *t.* 8. *f.* 3. (sori inaccurate);—Oxygonium, *Pr. Tent. Pterid. p.* 118. *t.* 4. *f.* 11. (venation only);—Callogramme Cæciliæ *Fée* 7 *me. Mém. Foug. Nouv. p.* 41. *t.* 8. *f.* 1.

The specimen figured is from Singapore—(Lobb.)

Hab. Singapore, Luzon.

PLATE No. CCXL.

Syngramma alismafolia

(Hook.)

ATHYRIUM.

ATHYRIUM BREVISORUM. (Wall.) Caudex ? stipes 1½ foot and more long stramineous-brown below, scarcely a line wide glossy, frond 1½-2 ft. long ovato-lanceolate membranaceous bi-tripinnate, primary pinnæ long-petiolate remote erecto-patent a foot and more long broad-lanceolate acuminate, secondary pinnæ 5-6 inches long lanceolate nearly sessile pinnated, pinnules numerous approximate oblong-lanceolate much acuminate horizontally patent 1-1½ inch long coarsely serrated rarely subpinnatifid the serratures very acute almost mucronate lowest pinnules more distant on short petiolules, intermediate ones more approximate the lower base decurrent, upper ones confluent, veins pinnated, veinlets forked once or more, sori generally in two rows oblique near the costule in the pinnules that are pinnatifid extending to the lobes small short-linear straight or lunate, involucres slightly convex jagged at the margin, main rachis stramineous glossy flexuose. *Hook. Sp. Fil.* iii. 229 ;—*Wall. n.* 220, (*not Mett*).

The specimen figured is from the mountains near Ava—(Wallich).

Hab. Ava mountains, Mishmee, Port Natal !

PLATE No. CCXLI.

Athyrium brevisetum
Wall.

ATHYRIUM.

ATHYRIUM SUBTRIANGULARE. (Hook. MSS.) Stipe 8-10 inch long smooth and naked above, clothed below with a few large lanceolate brown scales, frond about 1 foot each way deltoid tripinnatifid, lower pinnæ much the largest 4-6 inches long, 1½-2 inch broad, pinnules oblong-lanceolate cut down nearly to the rachis into numerous close sharply-toothed linear-oblong lobes, texture herbaceous, rachises and surfaces naked, veinlets of the segments 4-5 on each side, the lower ones forked, upper sori round, the lower ones oblong, sometimes slightly curved—Athyrium crenatum var. *β.*—*Hook. Sp. Fil.* iii. 225. A Hookerianum *Moore.* Allied to the Siberian and North European A crenatum *(Fries)*, but much more finely divided and sharply cut, and the sori are almost like those of Cystopteris.

The specimen figured is from Sikkim—(Dr. Hooker), and represents the two lowest pinnæ: the outline of the whole frond is exactly deltoid.

Hab. Sikkim—Himalaya, 10-[illegible],000 ft. elevation.

PLATE No. CCXLII.

Athyrium subtriangulare (Hook.)

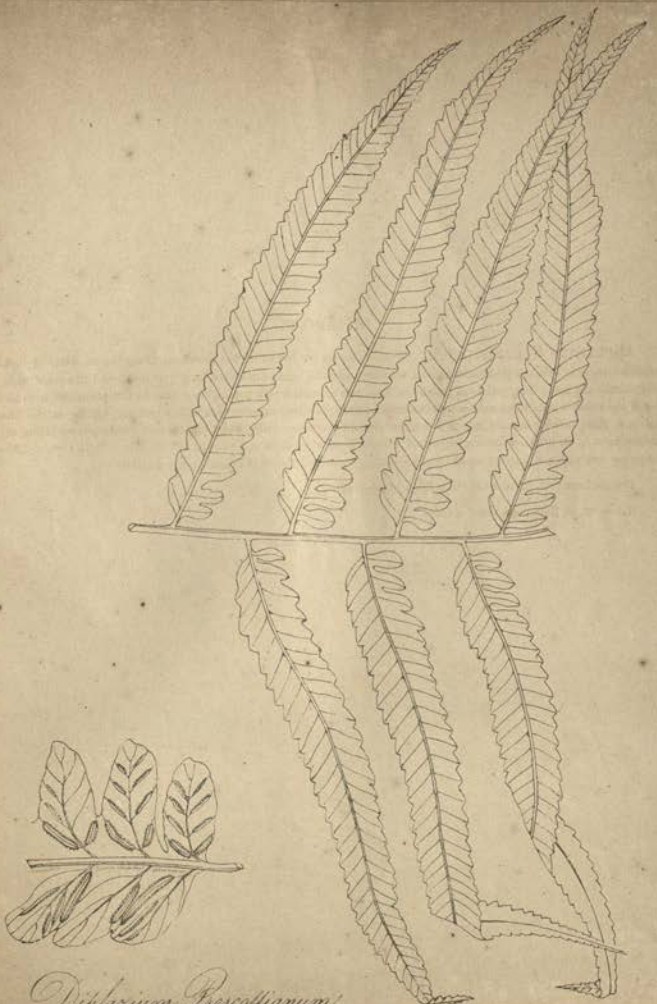
DIPLAZIUM.

DIPLAZIUM PRESCOTTIANUM. (Wall.) Caudex ↑ stipes a foot and more long tawny-brown, frond 1½ foot and more long subdeltoideo-ovate, sub-coriaceo-membranaceous acuminate pinnate, pinnæ 5-6 inches long, ½ an inch or a little more wide from an obliquely cuneate and rather long petiolated base linear-lanceolate acuminate very patent, lower ones dentato-pinnatifid, intermediate ones with 3-4 of the superior basal lobes cut down to the costa (almost pinnules), superior ones with a solitary auricle at the base above, terminal ones short entire confluent into a lanceolate pinnatifid acumen, veins patent pinnate each fascile corresponding with a lobe dichotomous most of the branches bearing diplazioid sori of unequal lengths. *Hook. Sp. Fil.* iii. 251. *Wall. Cat. n.* 235.—var. *β.* superior pinnæ only with a solitary prominent auricle—var. *γ*, pinnules destitute of auricle or any deep lobes.

The specimen (var. *β.*) figured is from Singapore—(Wallich.)

Hab.—var. *β.* Singapore, var. *γ.* Penang.

PLATE No. CCXLIII.



Diplazium Prescottianum
Wall.

DIPLAZIUM.

DIPLAZIUM PINNATIFIDO-PINNATUM. (Hook.) Caudex erect thick with very coarse rooting fibres, stipites aggregate furrowed in front, rather stout a foot and more long, fronds 9-10 inches long broad-ovate nearly as broad as long firm-coriaceous opaque, pinnæ large 13-15, about 5 inches long very patent 1½ inch wide from a rather broad-cuneate nearly sessile base oblong-lanceolate acuminate strongly serrated those of the upper half of the frond confluent at the base, terminal segment large, lobed at the base, veins in pinnated facicles very patent, sori narrow-linear all diplazioid, frequently short and approximate to the costa. *Hook. Sp. Fil.* iii. 238.

The specimen figured is from Mishmee—(Griffith.)

Hab. Mishmee.

PLATE No. CCXLIV.

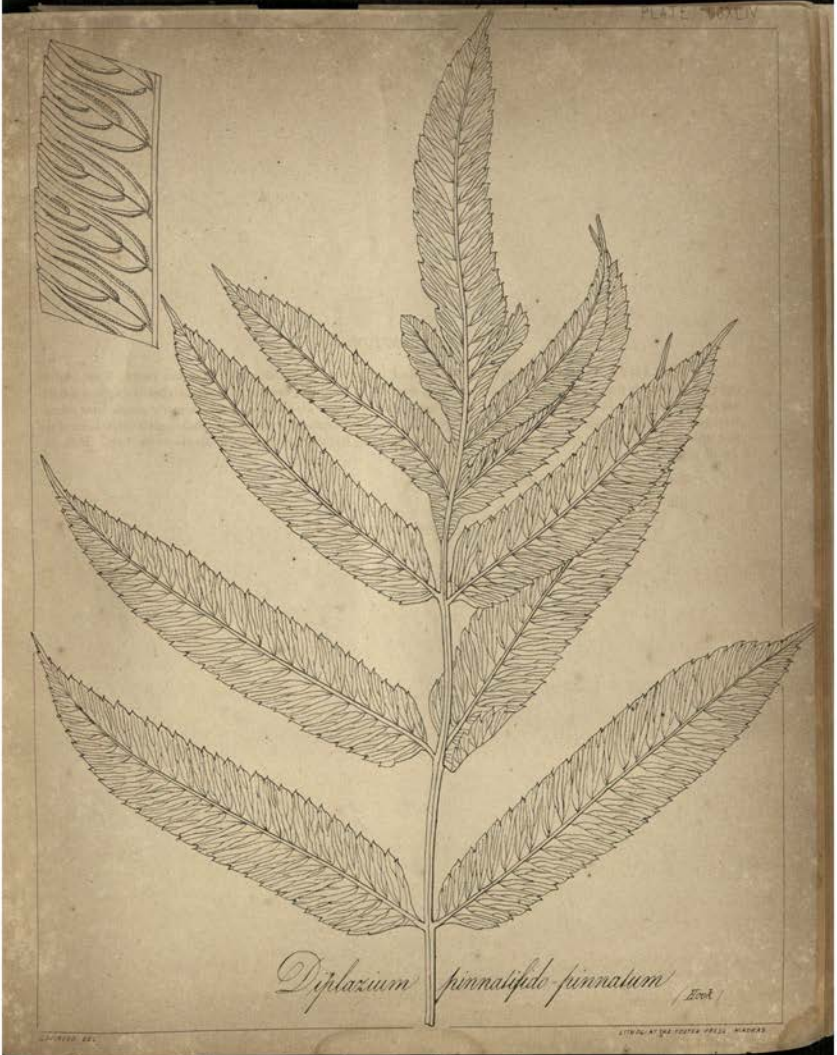


PLATE XLIV
Diplazium pinnatifido-pinnatum (Hook)
LITHOGRAPHIC PRESS MADRAS

DIPLAZIUM.

DIPLAZIUM PORRECTUM. (Wall.) Caudex erect or ascending stipites tufted 6-12 inches long subcastaneous, fronds 8-10 inches to 1½ foot long deltoid-oblong or pyramidal pinnate, pinnæ horizontal numerous 4-6 inches long petiolate or sessile and confluent at the acuminated pinnatifid apex, from a broad truncated and auricled or generally quite hastate base (having a distinct auricle above and below) linear-lanceolate obtuse or acuminate, lower ones more or less deeply pinnatifid, intermediate ones obtusely dentate, uppermost ones entire at the margins, veins patent pinnatifid in the auricles the rest once or twice forked, sori linear elongated confined to the superior or basal veinlet and extending its whole length, or on the two outer ones, mostly diplazioid, involucres membranaceous when young. *Hook. Sp. Fil.* iii. 250;—*Wall. Cat.* 204;—*(afterwards at p.* 63 *altered to A. multisoratum) (not* 224 *Wallich, which is A. protensum from Mauritius, and is afterwards at p.* 63 *altered to A. polyodon.) Mett. Aspl. p.* 177. *t.* 5. *f.* 1, 2;—Asp. auriculatum. *Wall. Herb.* 1823 *and Cat. n.* 204 *as synonym to A.* porrectum—Dipl. *Pr. Tent. Pterid. p.* 113,—Aspl. phanerotis. *Kze. in Bot. Zeit. p.* 194.

The specimen figured is from Penang—(Wallich.)

Hab. Penang and Singapore, Chapadong Hill, Malacca, Borneo.

PLATE No. CCXLV.

PLATE CCXLV.

Diplazium porrectum (Wall.)

LITHOG. AT THE GOVERNMENT PRESS, MADRAS.

DIPLAZIUM.

DIPLAZIUM SORZOGONENSE. (Presl.) Caudex stout horizontal densely covered with long subulate falcate black-brown, stipites scattered distant stout 4 inches to a span long purplish-brown shaggy with crinite, curly, black-brown scales deflexed towards the base, fronds 1-2 feet long subcoriaceous dark blackish green when dry, ovato-lanceolate pinnate pinnatifid at the apex, pinnæ numerous horizontal sessile or nearly so 2½ to nearly 6 inches long from a truncated base oblong elongato or linear-oblong acuminate pinnatifid serrated towards the apex, segments more or less deep oblong obtuse or retuse subfalcate entire or serrated at the apex, veins pinnated in each lobe, veinlets simple obliquely patent almost all soriferous, sori linear lower ones only diplazoid, rachis and costæ especially beneath deciduously crinite or hairy. *Hook. Sp. Fil.* iii. 252 ;—*Pr. Rel. Hœnk.* 1 *p.* 45 ;—*Mett. Asp. p.* 185 ;—*Pr. Tent. Pter. p.* 114 ; Hypochlamys. *Fée Gen. Fil. p.* 200 ; D. acuminatum. *Bl. En. Fil. Jav. p.* 193 ? D. Smithianum ;—*Kze. Bot. Zeit.* vi. *p.* 195.

The specimen figured is from Sikkim,—(Hook. Fil. and Thomson.)

Hab. Sikkim 8—10,000 feet, Bhotan, Luzon, and Sorzogon, Java, Leyte, Borneo ?

PLATE No. CCXLVI.

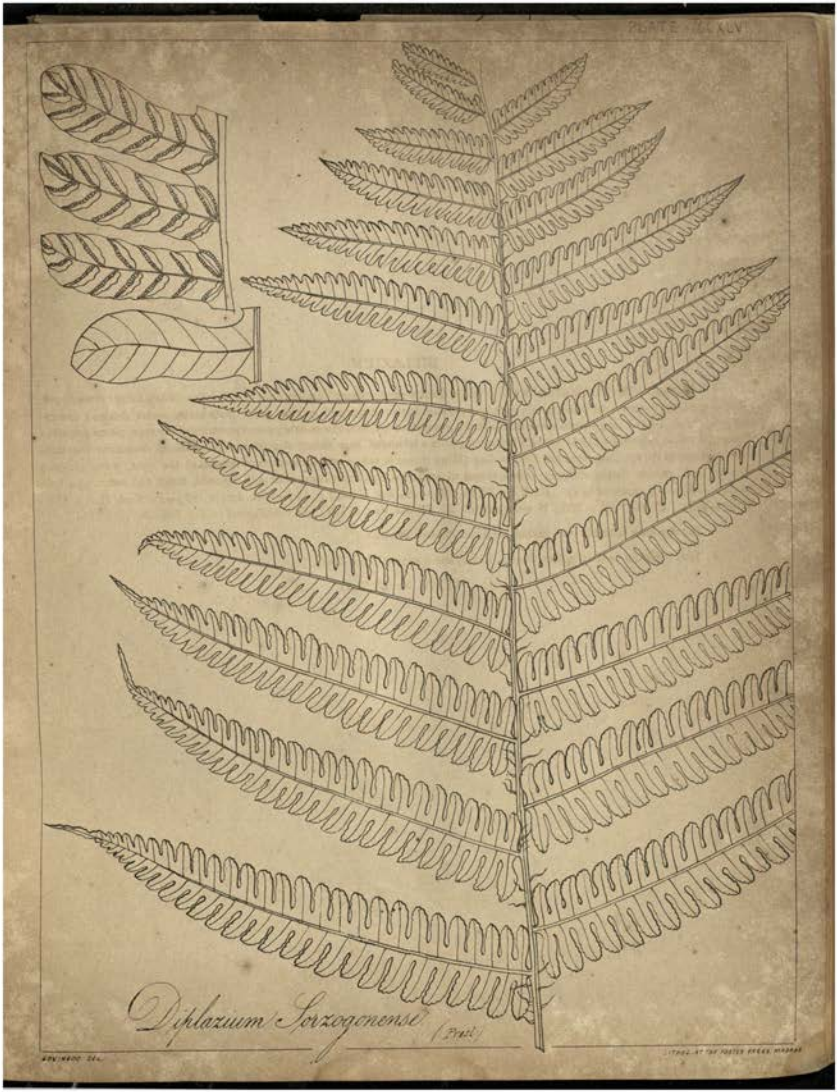


PLATE XLV
Diplazium Sorzogonense (Prist)

DIPLAZIUM.

DIPLAZIUM LOBULOSUM. (Wall.) Caudex erect small densely clothed with the bases of old stipites paleaceous, stipites tufted 5-6 inches long, fronds broad-lanceolate acuminate membranaceous a span to 14 inches long pinnated pinnatifid at the apex, pinnæ on slender petioles 1½-3 inches long very patent broad-lanceolate falcate sharply acuminated truncated and auricled at the superior base, inferior base excised the margin more or less deeply lobed, lobes as well as the auricles spinulosely inciso-serrate, costa slender flexuose vein-like, veins in oblique fascicles corresponding to each lobe, dichotomous lowest superior branch only soriferous, sori mostly asplenioid linear neither attaining the costa nor the margin. *Hook. Sp. Fil.* iii. 252;—*Wall. Cat. n.* 210;—*Mett. Aspl. p.* 163. D. longifolium, *Moore. Ind. Fil. p.* 141.

The specimen figured is from Nepaul—(Wallich).

Hab. Nepaul, Simla.

PLATE No. CCXLVII.

Diplazium lobulosum

THAMNOPTERIS.

THAMNOPTERIS SIMONSIANA. (Hook.) Small, fronds 1½ foot long, 1½ inch broad cæspitose chartaceous, elongato-lanceolate abruptly and narrowly acuminate (rostrate) gradually and very much attenuated below into a short stipes, veins approximate suberecto-patent, sori copious rather distant, three-fourths the length of the veins and occupying three-fourths of the superior portion of the frond. *Hook. Sp. Fil.* iii. 81. *Ic. Plant. t.* 925. *Mett. Asp. p.* 86.

The specimen figured is from Khasya—(Simons).

Hab. Khasya and Unker Hills.

PLATE No. CCXLVIII.

Thamnopteris Simonsiana (Hook.)

BAKER DEL. LITHOG. AT THE FOSTER PRESS MADRAS.

BLECHNUM.

BLECHNUM FINDLAYSONIANUM. (Wall.) Caudex very small, stipes short, frond ample 2-4 feet ovato-lanceolate subcoriaceous pinnated, pinnæ erecto-patent rather distant 6-12-14 inches long 1 inch to 1¾ wide oblong or elongato-oblong sessile obliquely cuneate at the base entire, upper ones much decurrent, but (except the two upper ones) not coadvnate, the apex suddenly and sharply acuminated, several of the lowest pairs abortive reduced to small hard scales, the surface glossy, veins obscure compact parallel, sori close to the costa continuous narrow-linear, involucres also very narrow and indistinct. *Hook. Sp. Fil.* iii. 53. *Wall. Cat. n.* 2172. *Hook. et. Grev. Ic. Fil. t.* 225. Blechnopsis Findlaysoniana. *Pr. Epim. Bot. p.* 116.

The specimen figured is from Singapore.

Hab. Singapore, Penang, Labuan, Borneo.

PLATE No. CCXLIX.

PLATE CCXLIX

Blechnum Findlaysonianum Wall.

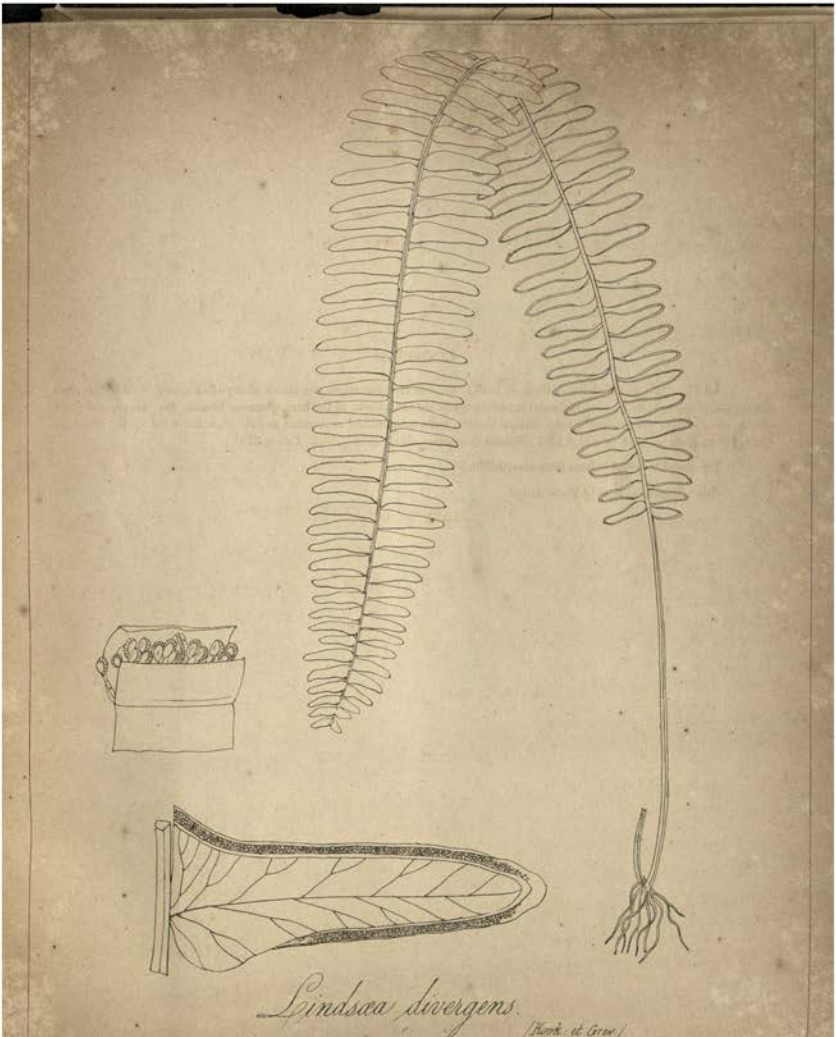
LINDSÆA.

LINDSÆA DIVERGENS. (Hook. et. Grev.) Caudex creeping, stipes and rachis ebony-black glossy, fronds lanceolate pinnate, pinnæ approximate crowded horizontal lanceolate obtuse subsemihastate at the base, glaucous beneath, the sides equal, costa central, veins oblique once forked distant internal obscure, sorus marginal and continuous on both edges and at the apex. *Hook. Sp. Fil.* i. 210 ;—*Hook. et. Grev. Ic. Fil. f.* 226. Vittaria divergens. *Herb. Roxb. Wall. Cat. n.* 2191.

The specimen figured is from Malacca—(Griffith.)

Hab. Malacca—Prince of Wales' Island.

PLATE No. CCL.


Lindsæa divergens.
[Hook. et Grev.]

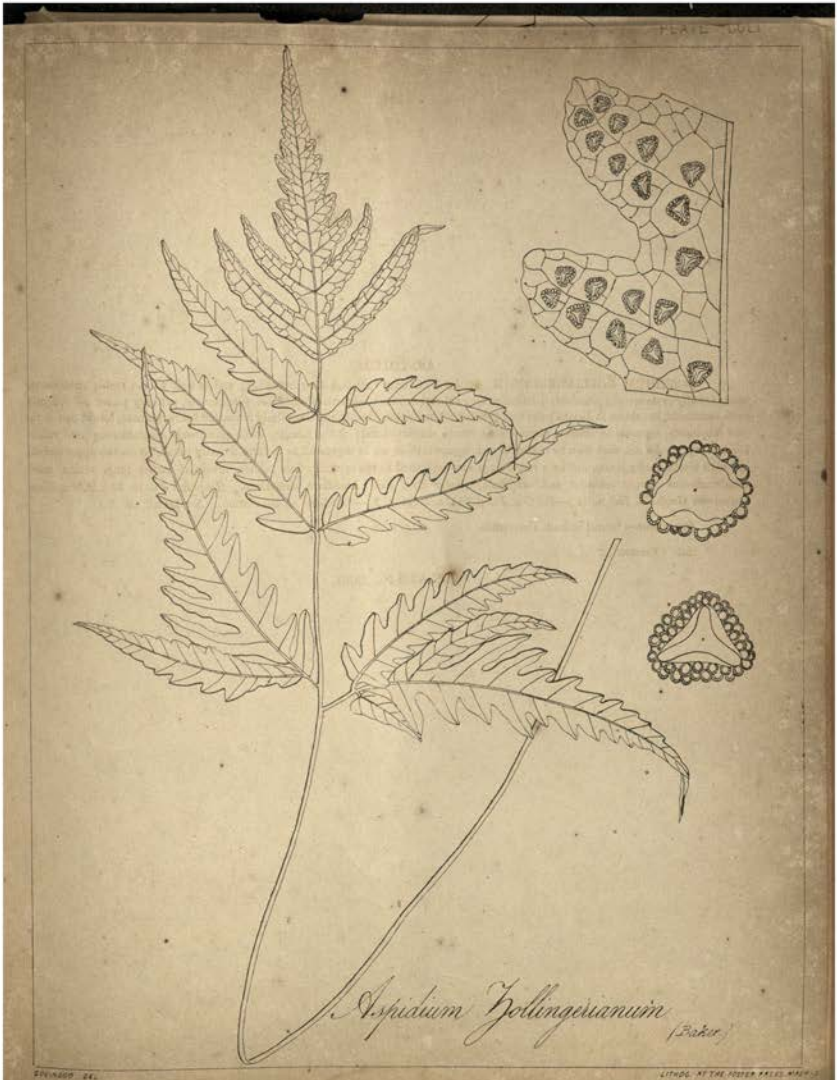
ASPIDIUM.

ASPIDIUM ZOLLINGERIANUM. (Baker.) Caudex? stipites 6-10 inches long and as well as the rachis stramineous, fronds broadly ovate scarcely acuminate 6-10 inches long subcoriaceo-membranaceous subbi-below tripinnate, primary pinnæ 5-7 obliquely ovate acuminate, but obtuse in distant pairs long-petioled 2-4 inches long deeply and irregularly pinnatifid below pinnate, lowest pair at the base subpinnate, segments or ultimate pinnæ oblong obtuse sinnuato-lobate at the margin, veins prominent anastomosing unto suborbicular large areoles not more than two series in each segment, these are so depressed as to form a cavity (pustuled on the upper surface) and each areolar cavity is occupied by a rather large sorus attached to the apex of a free veinlet, involucre rather large with a broad membranaceous margin orbicular and subpeltate. *Baker Syn. Fil.* Aspidium immersum. *Hook. Sp. Fil.* iv. 58; Phlebigonium impressum *Griff. Pl. Ind. n.* 34;—*Fée Gen. Fil. p.* 314. *t.* 24. *A. f.* 2;—Aspidium an trifoliatum. *Sw.* (*Wall. M. S.*)

The specimen figured is from Tenasserim.

Hab. Tenasserim.

PLATE No. CCLI.


Aspidium Zollingerianum
(Baker)

LASTREA.

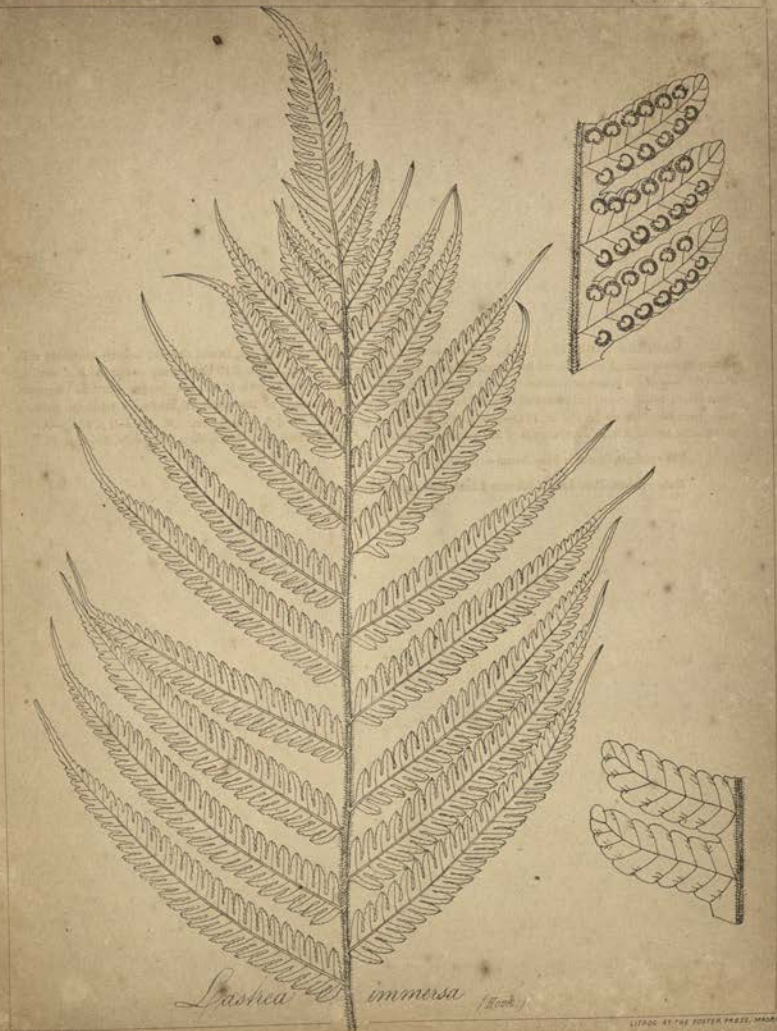
LASTREA IMMERSA. (Hook.) Caudex creeping stipes elongated 3-4 feet long, fronds glabrous or finely pubescent with scattered glands beneath from a broad base ovato-oblong or oblong acuminate pinnate, pinnæ 8-10 inches long sessile with a swelling round the base of the pinnæ (articulated?) linear attenuated at each extremity long acuminate at the apex deeply pinnatifid, segments linear-oblong entire obtuse, sori immersed arranged between the costule and the margin of the segments, involucres reniform glabrous entire persistent. *Hook. Sp. Fil.* iv. 112.—*Metten. Fil. Hort. Lips. p.* 91. *t.* 18. *f.* 1-3;—Aspidium. *Bl. En. Fil. p.* 156;—A. impressum (ex errore) *Kze. in Linnæa* xxiii. *p.* 227; Lastrea verrucosa. *J. Sm. in Hook. Bot. Journ.* iii. *p.* 411;—*Pr. Epim. p.* 36.

The specimen figured is from Assam—(Griffith).

Hab. Assam, Java, Luzon, Johanna Island, East coast of Tropical Africa.

PLATE No. CCLII.

PLATE CCLII.



Lastrea immersa (Hook.)

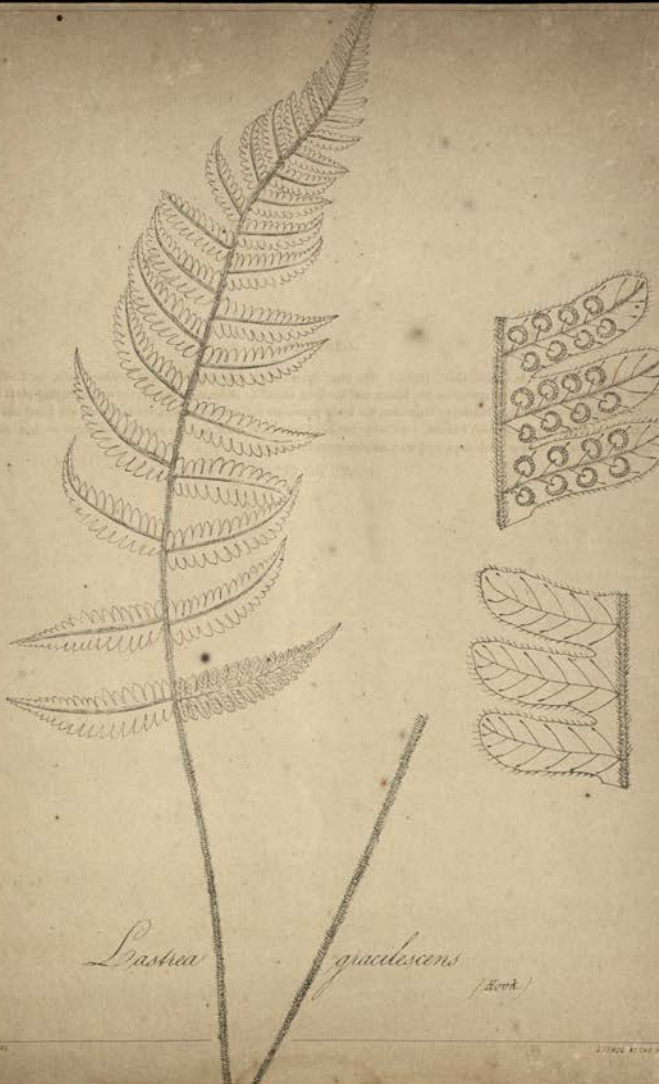
COVINDOO DEL.

LITHOG. AT THE FOSTER PRESS, MADRAS.

LASTREA.

LASTREA GRACILESCENS. (Hook.) The plant figured at Pl. CX. of the Ferns of Southern India as Lastrea esracilescens is now separated from that species by Mr. Baker, and has been named L. Beddomei (Baker): the accompanying plate is a figure of the true esracilescens from the Himalayan Mountains, the lower pinnæ are not reduced in size, the rachis of both frond and pinnæ and the costa of the pinnules (or segments) beneath, are thickly furnished with short hairs, and the margins are more or less ciliated, the fronds are otherwise glabrous on both sides, and are membranaceous in texture.

PLATE No. CCLIII.


Lastrea gracilescens
(Kunth)

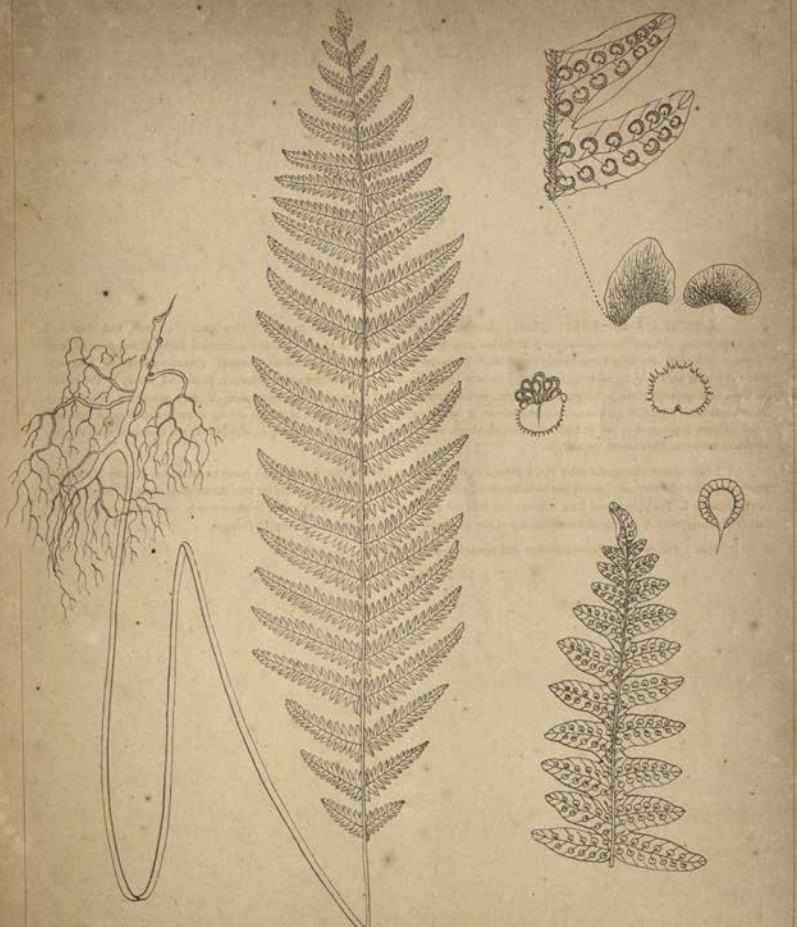
LASTREA.

LASTREA FAIRBANKII. (Bedd.) Caudex long creeping as thick as a crow quill very black glabrous, but furnished with a few scales, copiously rooting—stipes 8-20 inches long stramineous, black at the base, rachis channelled above glabrous or slightly pubescent with weak glandular hairs, fronds coriaceous 6-10 inches or more long narrow oblong pinnated, pinnæ opposite or alternate, sessile or nearly so, 1—1½ inches long, less than ½ an inch broad, linear obtuse or acuminate at the apex, pinnatifid nearly to the rachis, the lower ones reduced in size and often more distant, rachis channelled and glabrous on the upper side, slightly pubescent or glabrous beneath and there furnished with numerous broad-ovate or lunate very transparent scales, segments oblong to ovate entire much recurved at the margins, veins more or less undulate, veinlets all simple not forked excurrent at the margin, sori one on the centre of each veinlet, involucre reniform, fimbriate at the margin.

I have named this species after Mr. Fairbank of the American Mission, who first pointed it out to me on the Pulney Mountains, where it seems to be very rare (and it has been not found elsewhere though it probably occurs on the Anamallays and Nilgiris), it is nearly allied to L. Thelypteris, and I am not sure that it is not a variety of that species, the texture however is very coriaceous, and if a variety of Thelypteris, it is very distinct from any of the European or Himalayan forms in my Herbarium.

Hab. Pulney Mountains—4000 feet and upwards—(in Swamps.)

PLATE No. CCLIV.



Lastrea Fairbankii. (Bedd.)

LITHOG. BY THE FOSTER PRESS, MADRAS.

SCHIZÆA.

SCHIZÆA MALACCANA. (Baker.) Stipes dense not distinguishable from the frond, which is 4-8 inch long, weak, flexuose, subteretc, channelled in front not more than 1-6 line thick, the barren and fertile ones similar; fertile segment erect often bilateral ½ inch deep with 3-6 slender spreading spikes on each side, the lowest 2-2½ lines long. *Baker Syn. Fil. inedit.* S. propinqua *Presl. Suppl. Tent. Pterid. p. 74 in part.*

The specimen figured is from Moulmein—(Lobb.)

Hab. Moulmein, on Mount Gedé 3500 feet, Malacca, Phillippine Islands, Borneo.

PLATE No. CCLV.

Schizaea Malaccana.

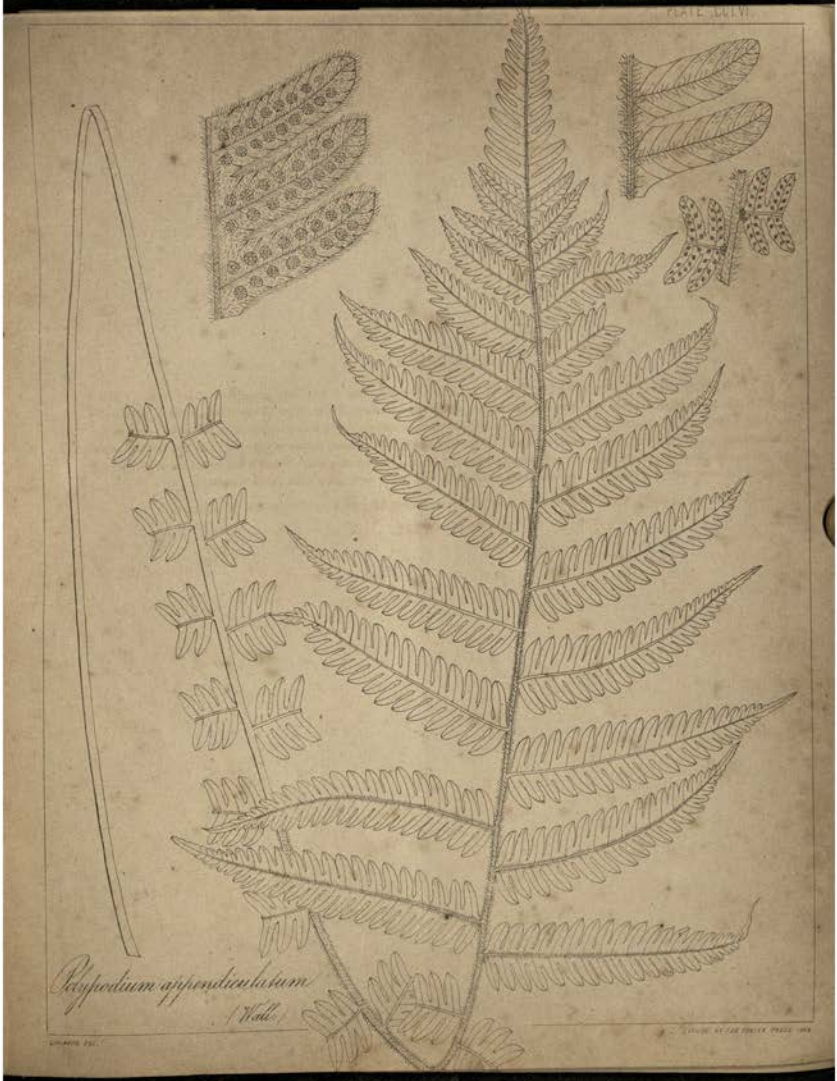
(Baker.)

POLYPODIUM.

POLYPODIUM APPENDICULATUM. (Wall.) Caudex? stipes about 1 foot long pubescenti-pilose, fronds 1-2 feet long, 6-8 inches broad pinnate, pinnæ alternate, membranaceous, sessile or subsessile with a small gland at the base beneath, patent 3-4 inches long, $\frac{3}{4}$ to 1 inch broad, gradually diminishing in size towards the apex and ending in a long acumination, pinnatifid nearly to the rachis, segments approximated with narrow sinuses, linear oblong entire or slightly crenated, obtuse at the apex, costa and costules setose above, pubescenti pilose beneath, rachis setose and pubescenti-pilose, veins 8-9 pair on each side, all simple not forked scarcely touching the margin, the lower pair with their apex above the base of the sinus, sori one to each vein a little below the centre.

The specimen figured is from Nepal (Winterbotham), it is intermediate between P. erubescens and auriculatum.

PLATE No. CCLVI.



Polypodium appendiculatum
Wall.

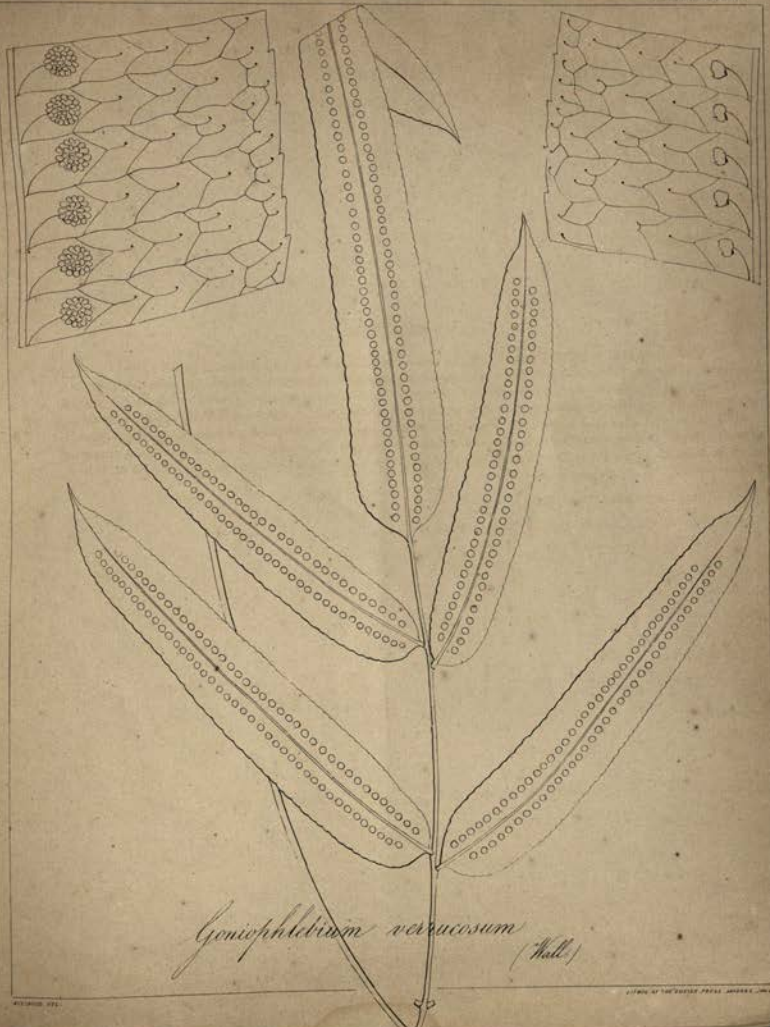
GONIOPHLEBIUM.

GONIOPHLEBIUM VERRUCOSUM. (Wall.); caudex long stout creeping, very paleaceous, stipites 1½ foot and more long, fronds 2-3 feet long oblongo-acuminate firm-membranaceous drooping, pinnæ numerous but distant, 6-9 inches long 1-1½ inch broad, oblong costate articulate upon the rachis suddenly and shortly cuspidato-acuminate entire or serrated chiefly towards the apex nearly sessile, the base obliquely cuneate, primary veins slender but straight and parallel costuliform, forming with the anastomosing veins four or five series of areoles each with a free included veinlet, but of which the lowest series only is soriferous, sori in a single series next the costa sunk in a deep cavity having a corresponding pustule on the upper side, capsules long stipitate mixed with paraphyses. *Hook. Sp. Fil.* v. 31. *Wall. Cat. n.* 296. *Metten. Polyp. p.* 81. *Hook. Gard. Ferns, t.* 41 ;—Marginaria, *Hook. Gen. Fil. t.* 10. B. ;—Goniophlebium, *J. Sm. β.* ; pubescenti-villous (Young).

The specimen figured is from Penang.

Hab. Penang, Singapore, Amboyna, Ceram, Java, Luzon.

PLATE No. CCLVII.



Goniophlebium verrucosum (Wall.)

NIPHOBOLUS.

NIPHOBOLUS BOOTHII. (Hook.); caudex ? stipes 16 inches long and stout in proportion, tawny-brown paleaceous with imbricating ferruginous lanceolate scales only at the very base, frond carnoso-coriaceous, 16-24 inches long 3-4 inches wide, elliptico-lanceolate obtusely acuminate, moderately attenuated glabrous and punctated above with minute blackish dots (probably corresponding with the receptacles of the sori), beneath covered with a dense velvety mass of ferruginous stellated tomentum, primary costular veins evident but not prominent united by transverse arched veins as in Campyloneurum, 10-12 series between the costules each including several free soriferous veinlets, sori small partially sunk in the tomentum forming transverse lines between the costules and as many as there are areolæ. *Hook. Sp. Fil.* v. 53.

The specimen figured is from Bhotan.

Hab. Bhotan, Eastern Himalaya.

PLATE No. CCLVIII.

PLATE CCLVIII.

Nyphobolus Boothii (Hook.)

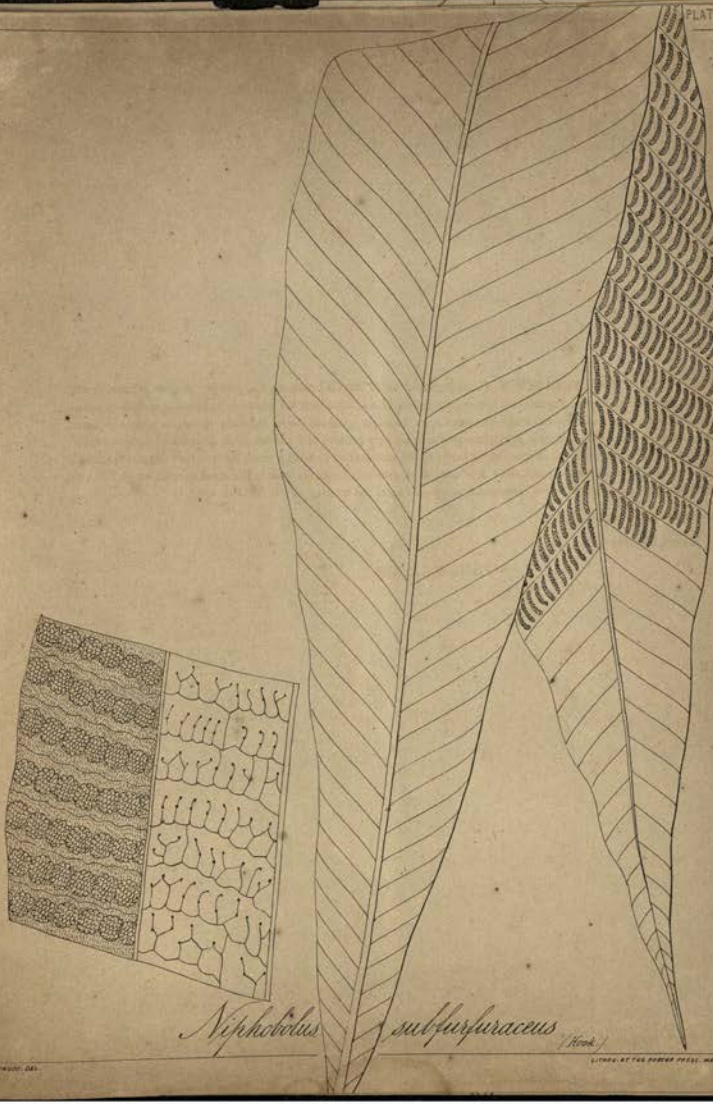
NIPHOBOLUS SUBFURFURACEOUS. (Hook.); caudex short branched creeping, the younger branches paleaceous with ferruginous subulate scales, stipites subaggregated, 4-5 inches long, fronds 24-30 inches long 4-5 inches wide, broad-lanceolate or oblanceolate sharply acuminated below, gradually and much attenuated upon the stipes, glabrous above, minutely stellato-tomentose beneath, the tomentum thin, firm and close so as to appear subfurfuraceous or compactly pannose of a whitish color, costa stout, costules evident but not elevated, venation indistinct quite that of true Campy loneuron, the areoles from 15-20 in a series between the costa and the margin each with numerous include free soriferous veinlets, sori rather small, most copious all over the back of the frond elevated subglobose (not in the least sunk) forming as many arched series between the costules as there are areoles. *Hook. Sp. Fil.* v. 52.

The specimen figured is from Bhotan.

Hab. Bhotan, Mishmee.

PLATE No. CCLIX.

PLATE CCLIX.



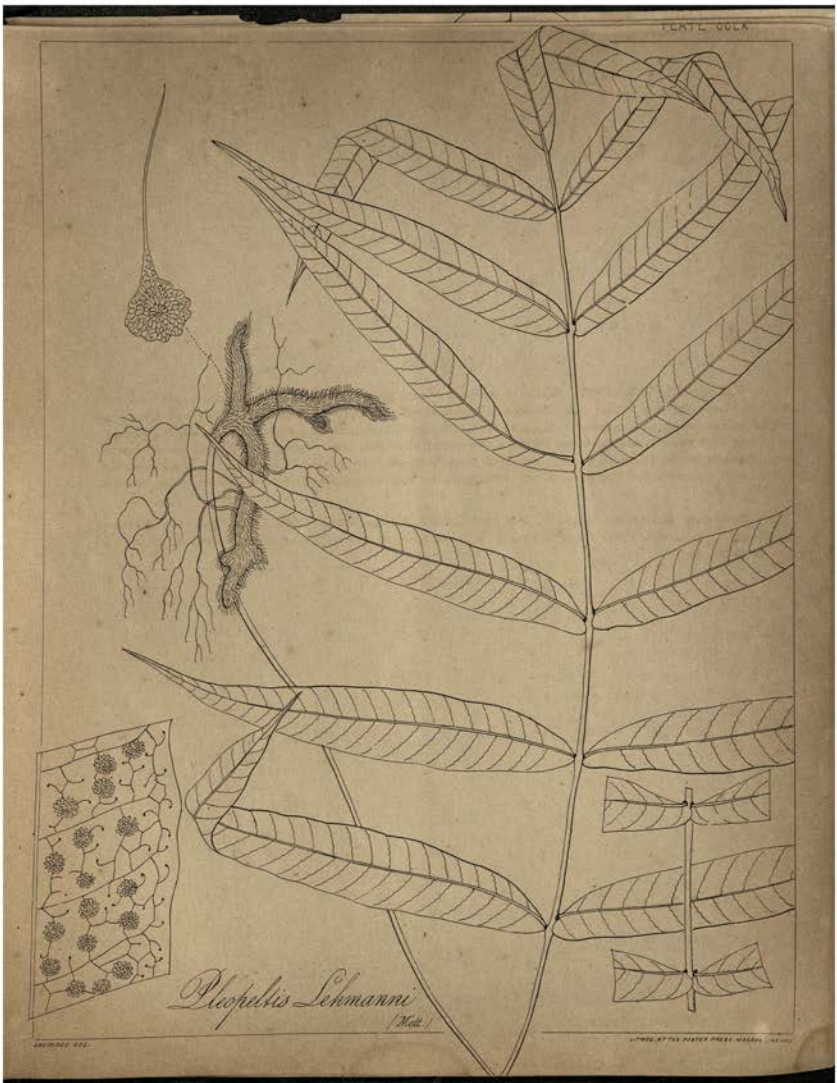
Niphobolus subfurfuraceus (Hook.)

PLEOPELTIS.

PLEOPELTIS LEHMANNI (Mett.) Caudex stout, creeping clothed with ovate or orbicular glabrous scales each ending in a very long acumination, stipes 8 inches or more long, glabrous as well as the rachis and frond, fronds 1½ to 2 feet long coriaceo-submembranaceous pinnate, pinnæ opposite or subopposite sessile with a gland-like articulation at the base (terminal one long petioled) linear oblong entire with a caudate acumination 4-6 inches long about ¾ of an inch broad, superior base obliquely excised, inferior base amplexicaule, costules evident not extending quite to the margin connected by the transverse veins which form about 4 series of areoles in which are free simple or forked veinlets with clavate apices, sori irregular, generally 4 to 6 in two rows between the costules. *Mett. Poly. p.* 229.

The specimen figured is from Darjeeling. It is nearly allied to P. Moulmeinensis, Pl. No. CCV. of this work which Mr. Baker informs me is P. juglandifolium (Don.) This latter name Sir W. Hooker gives as a synonym to P. capitellata, Wallich, but he does not appear to describe the present species.

PLATE No. CCLX.


Pleopeltis Lehmanni
(Mett.)

LASTREA.

LASTREA CONIIFOLIA. (Wall.) At page 36 and Plate CL of the Ferns of Southern India, I followed Sir W. Hooker in considering this species only a more compound variety of L. aristata. (Sw.) Mr. Thwaites lately drew my attention to the fact that the two ferns are quite distinct, this having an erect caudex and aristata a long creeping one; they are otherwise very similar, but coniifolia is much the larger and is more compound, individuals of each species differ much in the manner in which they are cut. I have given in this plate a pinna of a more than usually cut variety of coniifolia (from the Sispara ghaut, Nilgiris) and the erect caudex of a juvenile specimen. I have also represented the creeping caudex of aristata. Both ferns are common in all our western forests.

PLATE No. CCLXI.

PLATE CCLXI.

Lastrea coniifolia (Wall.)

LASTREA.

LASTREA SETOSA. (Bedd.) Caudex erect, stipes 1 foot long, sparsely covered with small flaccid subulate light-brown scales, fronds tufted 3-3½ feet long, tripinnate, pinnæ 8-10 inches long, lowest pair nearly as long as the central ones, gradually decreasing in size towards the apex, pinnules pinnatifid to nearly the rachis but always more or less connected by a decurrent wing, very membranaceous and flaccid, and furnished on both sides sparsely (as is the rachis and costa) with long weak pellucid jointed setæ, segments of the pinnules generally as broad at the apex as at the base more or less pinnatifid with the lobes obtusely rounded or variously toothed, veins forked and simple reaching the margin, sori one to each segment medial on the lower vein involucre reniform glabrous.

Hab. Moulmein Mountains 6,000 feet elevation (Parish, No. 175), a very delicate and beautiful species nearly allied to Lastrea scabrosa (Kze.) and to L. Blumei and recedens (Hook.)

PLATE No. CCLXII.

Lastrea setosa

(Bedd.)

COVINGHOE DEL.

LITHOG. AT THE HUSTON PRESS, MADRAS, MAY 1869

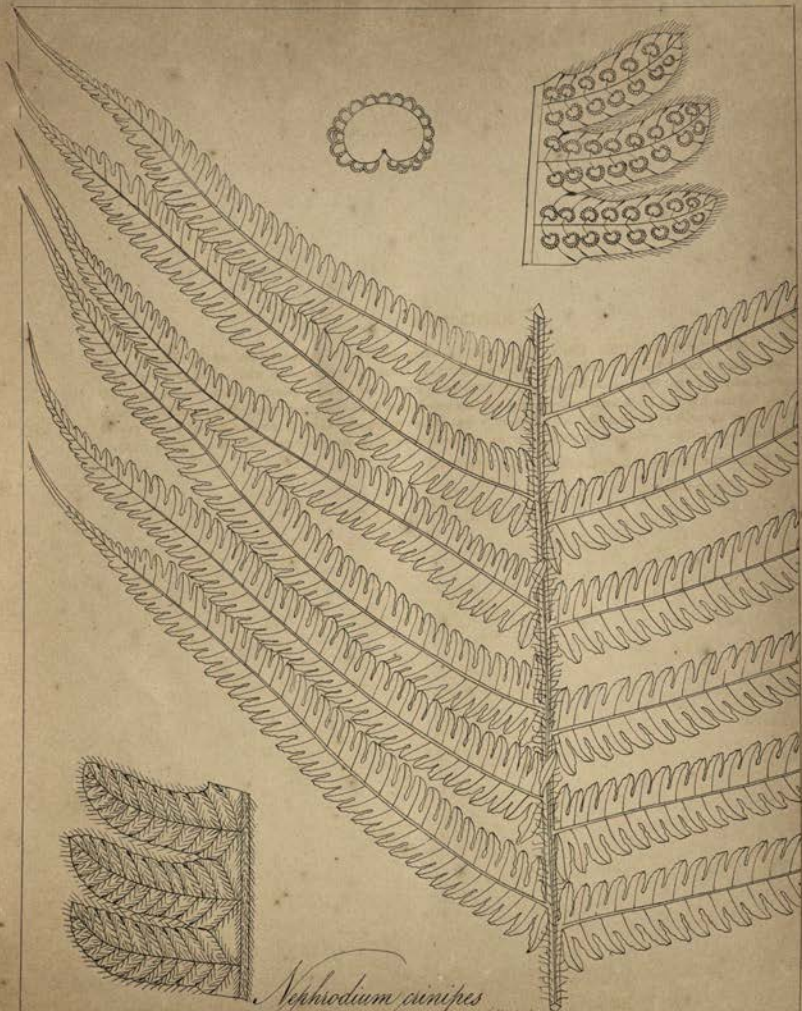
NEPHRODIUM.

NEPHRODIUM CRINIPES. (Hook.); stipes nearly 1 foot long and as well as the rachis stout and singularly erect and stiff stramineous, the former shaggy with copious long spreading flexuose subulate dark-brown scales which extend some way up the rachis, frond more than 2 feet long, submembranaceous quite glabrous from a broad base oblong-acuminate copiously pinnated, pinnæ 5-6 inches long less than ½ an inch broad, sessile horizontally patent from a broad base linear-oblong, finely acuminated pinnatifid more than half way down to the rachis with oblong subfalcate obtuse entire segments, lowest segments a little longer than the rest, lowest pair of veinlets united, sori on all the veinlets and on nearly every pinnæ, large cordato-reniform very membranaceous. *Hook. Sp. Fil.* iv. 71.

The specimen figured is from Sikkim-Himalaya (alt. 1000 ft.)

Hab. Sikkim-Himalaya.

PLATE No. CCLXIII.



Nephrodium crinipes (Hook.)

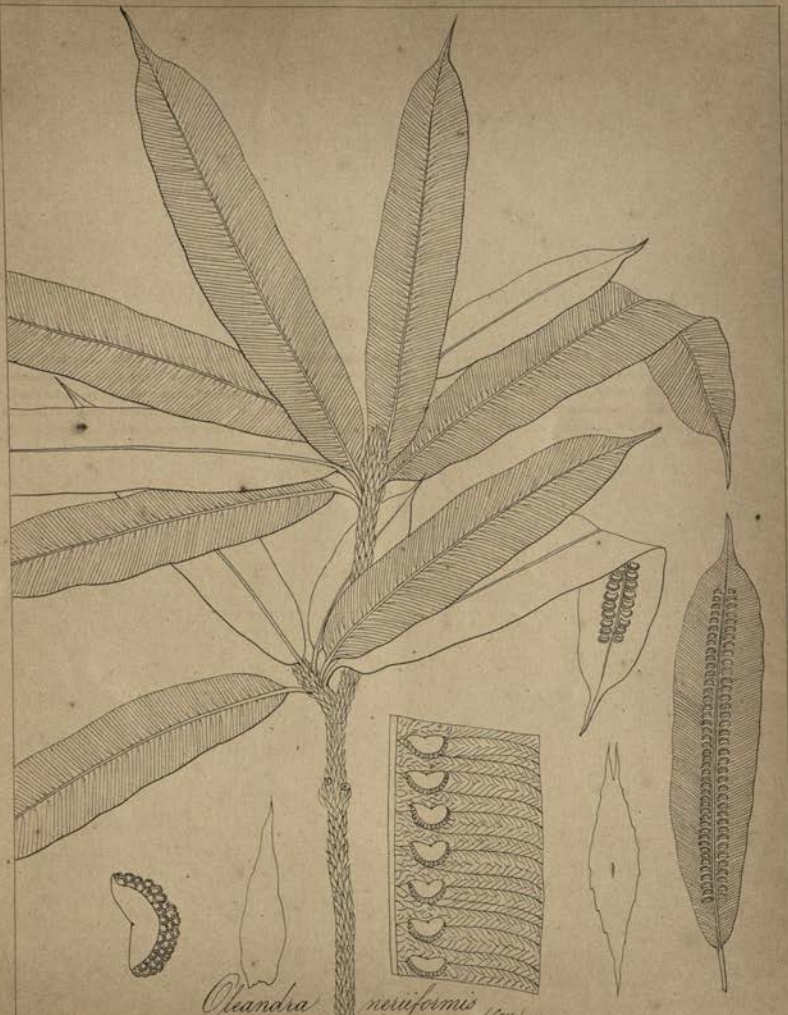
GOLINDOO DEL.

LITHOG. AT THE FOSTER PRESS, MADRAS, JAN. 1858.

OLEANDRA.

OLEANDRA NERIIFORMIS. (Cav.) The fern here figured is the true O. neriiformis (Cav.) and is from the Khasya Mountains—it has an erect woody stem, the species figured under this name at Pl. XCI of the Ferns of Southern India is Oleandra musæfolia, (Kunze.) and it has wide-trailing stems geniculate at the nodes. Sir W. Hooker does not describe this latter species, unless he has confounded it with neriiformis. O. Musæfolia is the only species found in South India and it is also abundant in Ceylon, but I do not know in what other localities; the neriiformis has a very wide range, being found in South America, Africa, Java, and in the Himalayas, &c.

PLATE No. CCLXIV.



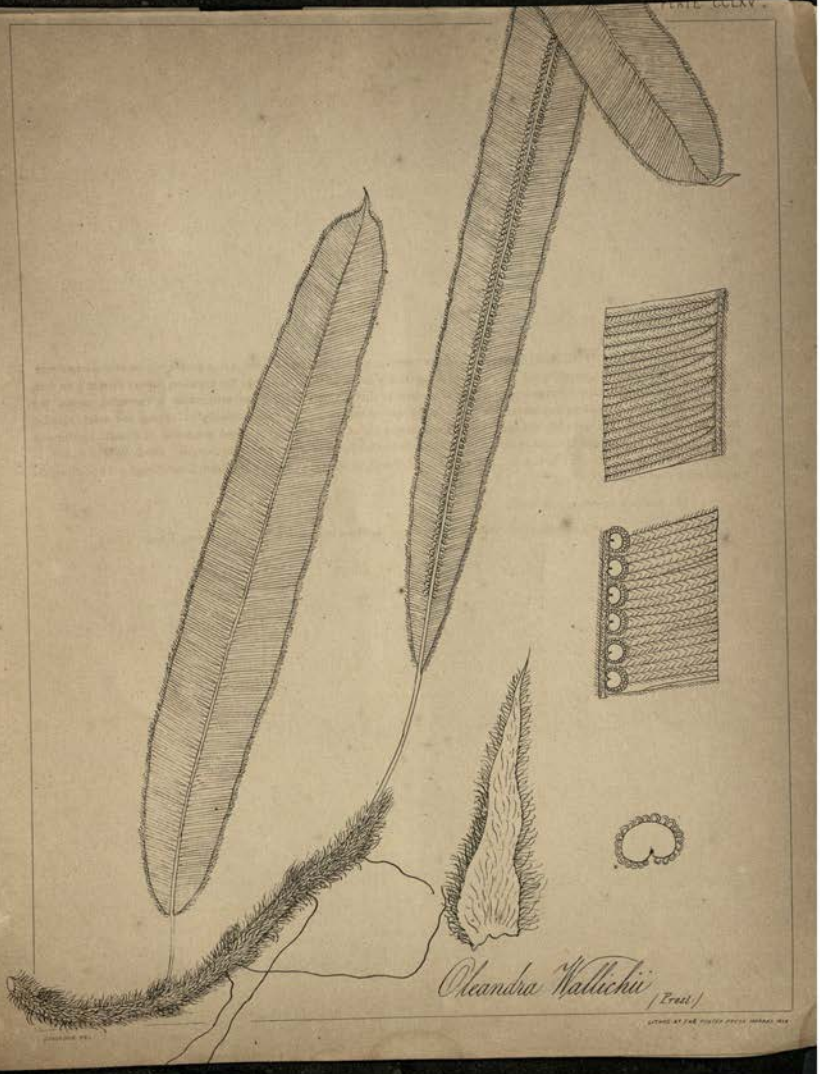
LITHOG. AT THE VEPERY PRESS, MADRAS, JAN. 1846.

OLEANDRA WALLICHII. (Presl.); caudex creeping, rooting, branched thicker than a goose-quill, densely clothed with subulate crisped ferruginous, spreading and often reflexed scales thickly tufted at the extremity of the branches, stipites distant ½ an inch to 2 inches long and sometimes paleaceous jointed close to the base so that the very short lower articulation is concealed among the scales, fronds 6-12-14 inches long membranaceous subpellucid opaque on the surface pilosulous subelliptical-oblong, the sides parallel, the base often obtuse and rounded, the apex suddenly and sharply acuminate, sori compact almost imbricated in a continuous line or chain close to and parallel with the costa on each side, involucres reniform ciliated opening towards the margin. *Hook. Sp. Fil.* iv. 158;—Aspid. Wallichii. *Hook. Ex. Fl.* i. p. 6. t. 5. *Kze. in Schk. Fil. Suppl. p.* 36. 19;—Oleandra Wallichii, *Tent. Pterid. p.* 78;—Neuronia asplenioides, *Don. Prodr. Fl. Nep. p.* 6.

The specimen figured is from Simla.

Hab. Nepal, North of India from Simla, and Kumaon in the West to Bhotan in the East, Assam, Khasya, Java?

PLATE No. CCLXV.


Oleandra Wallichii (Prest.)

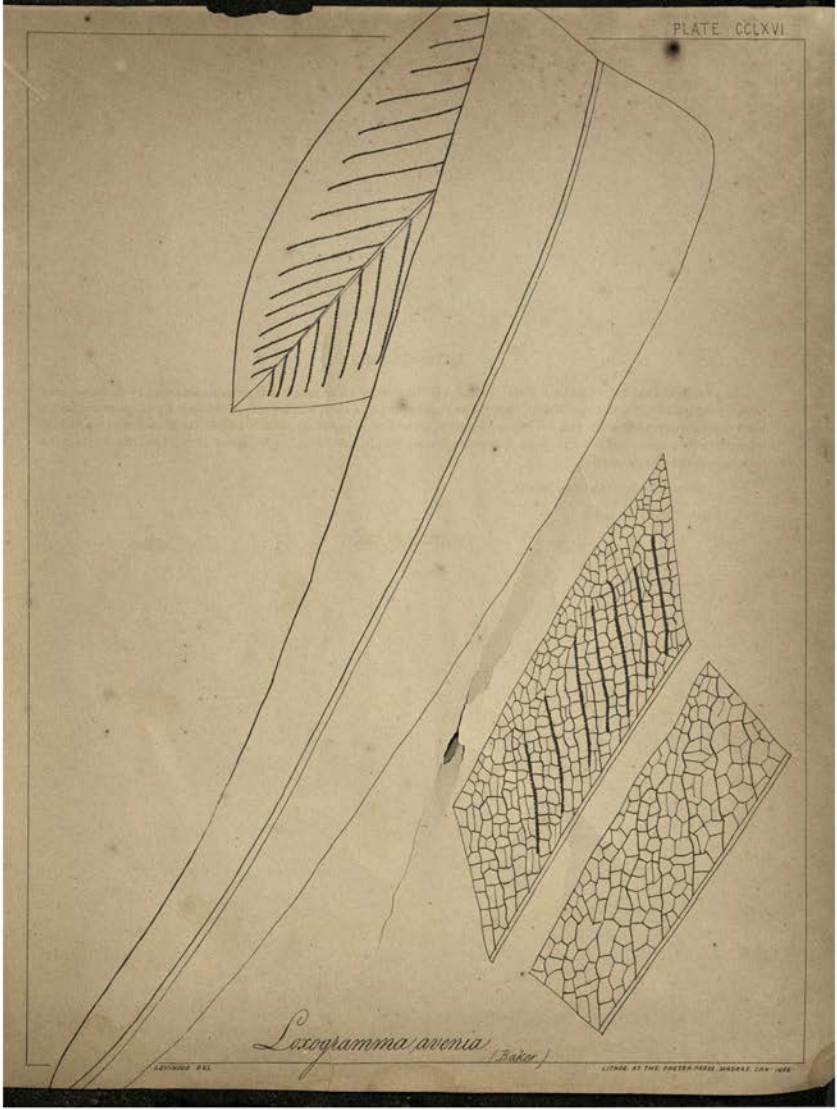
LOXOGRAMMA.

LOXOGRAMMA AVENIA. (Baker.) Caudex ? Stipe about 1 inch long, fronds glabrous coriaceous, 18-20 inches long linear oblong spathulate broader upwards, but narrowed and acute at the apex about 3 inches wide in the widest part, glabrous on both sides, venation evident reticulated with free veinlets in some of the areoles, no prominent costules though the primary veins are slightly thicker than the others. Sori in narrow linear more or less flexuose, parallel lines in the upper portion of the frond not touching the costa nor extending to the margin.

The specimen figured is from Penang.

Hab. Malay Peninsula.

PLATE No. CCLXVI.



Loxogramma avenia (Baker)

LOVEGROVE DEL. LITHOG. AT THE FOSTER PRESS, MADRAS, JAN. 1878.

ANTROPHYUM.

ANTROPHYUM PARVULUM. (Blume.); "Fronds shortly stipitate lanceolate acuminate at both extremities, submembranaceous ecostate, sori nearly straight exposed (nudi)." *Hook. Sp. Fil.* v. 170. *Bl. Fil. Jav. p.* 78. *t.* 34. *f.* 3. *Excl.* β. elongatum (*not* A. pumilum, *Kifs.*)—*Fée Antroph. p.* 45, *in part* (*Excl. Syn.* Hemionitis immersa, *Bory*, and the locality of *Bourbon.*)

The specimen figured is from Khasya (Dr. Hooker). It is nearly allied to A. reticulatum, if not a form of it.

Hab. Java, Penang, Tahiti, Khasya (4000 feet).

PLATE No. CCLXVII.

Antrophyum parvulum

(Bl.)

BAKER DEL.

LITHO. AT THE FOSTER PRESS, MADRAS.

SCHIZOLOMA.

SCHIZOLOMA MALABARICUM. (Bedd.) Caudex creeping, slightly scaly and furnished with thick wiry roots. Stipes tetragonous a third of the length to nearly as long as the frond, frond simply pinnated, pinnæ numerous alternate (decreasing in size towards the apex of the frond), membranaceous half ovate from a truncated base, narrow towards the apex, costa close to the lower margin, veins quite free or occasionally one or two anastomosing.

I have long considered this a variety of Schizoloma nitens (Bl.) figured at Plate XXVII of the Ferns of Southern India (under Wallich's name recurvatum), I now feel certain that they are distinct species. I have found large beds of this in Wynaad and South Canara, and it is always simply pinnate and its pinnules are half ovate with almost a pointed apex, whereas nitens is generally bipinnate and its pinnules have a very broad apex and often form an exact parallelogram ; the venation is besides different, in this species it is either quite free, or with only 1-2 veins anastomosing in each pinnæ ; in nitens all or almost all the veins anastomose. In Plate XXVII. of Ferns of Southern India, the artist has omitted the costa or marginal vein which runs close to the lower margin of the frond and the veins are erroneously represented as springing from the margin of the frond.

Hab. Malabar, South Canara.

PLATE No. CCLXVIII.

Schizoloma Malabaricum
(Bedd.)

PÆCILOPTERIS.

PÆCILOPTERIS PRESLIANA. (Hook.) Caudex stout creeping paleaceous with narrow attenuated lanceolate scales, stipes 6-10 inches long, more or less scaly as is the rachis and petioles, fronds 6-12 inches long pinnated glabrous, pinnæ submembranaceous remote subopposite petiolate, 2-4 inches long ½ an inch wide, narrow lanceolate acuminated at both ends, rachis more or less winged specially towards the apex of the frond; fertile fronds generally longer stipitate, pinnæ much contracted, wholly or sometimes only partially fertile, costules evident, connected by generally 2 pair of opposite veinlets which meet at an acute angle from which proceed a veinlet which is either free or joined to the veins above marginal veins free terminating in a dot within the margin. *Hook. Sp. Fil.* v. 265. Heteroneuron, *Fée Acrost. p.* 92. *t.* 39. *f.* 1;—Acrostichum punctulatum, *Pr.* (*not Sw.*) Campium, *Presl.*

The specimen figured is from Coorg, where I have only lately discovered it in great abundance on rocks in the bed of a river at the foot of the Bhagamundal ghat, just below Talle Cavery and at the confines of Malabar, Coorg and South Canara.

Hab. Coorg in rivers at the foot of the ghats (and probably in similar localities in Malabar and South Canara), Concan, (Law), Philippine Islands.

PLATE No. CCLXIX.

PLATE CCLXX

Pacilopteris Prestiana (Hook.)

PÆCILOPTERIS.

PÆCILOPTERIS SEMICORDATA. (Baker.) The fern here figured was drawn by Mr. Baker at Kew from a specimen collected by Mr. MacIvor on the Nilgiris, it is the "Acrostichum virens, variety fuscatu m." Hook. 2nd Cent. of Ferns, t. 87, but is not mentioned in Species Filicum, (at least separately from virens). I have never met with it unless it is (as I strongly suspect) only a form of the Fern figured at Plate CCII. of the Ferns of Southern India, as the Pœciloptcris repanda (J. Sm.), but which name should be altered to Pœciloptcris contaminans (Wall.) Sir W. Hooker unites this latter species the contaminans of Wall., with ternimans of the same botanist (Plate CCIII. of Ferns of Southern India) under the name of virens, they are however very distinct species.

PLATE No. CCLXX.

Pacilopteris semicordata (Baker.)

GYMNOPTERIS.

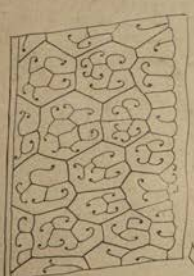
GYMNOPTERIS AXILLARIS. (Cav.) Caudex very long scandent flexuose here and there branched; sterile fronds rather distant (with very short stipites, almost none or 1-2 inches long and stramineous) membranaceous, 5-6 inches to 1 foot and more long, ½-1½ inch wide, lanceolate more or less acuminate, strongly costate entire gradually tapering below and long-decurrent sometimes to the base of the stipes and even auricled there; fertile fronds (with stipites 3-4 inches long a little scaly at the base) 6 inches to a foot long, 1-3 lines wide linear tapering at both extremities flexuose. *Hook. Sp. Fil.* v. 276. *Cav. Prælect.* 1801. *n.* 582.

The specimen figured is from South Canara, it is common in most forests on the Western side of India growing on trees. I have always looked upon as a mere variety of G. Feei (Plate XLVIII, Ferns of Southern India), but Sir W. Hooker thinks it a distinct species.

Hab. Western side of Madras Presidency, Ceylon, Bhootan, Assam, Sylhet, Burmah, Philippine Islands, Luzon, Java, Borneo.

PLATE No. CCLXXI.

PLATE CCLXXI.



Gymnopteris axillaris
(Lav.)

GYMNOPTERIS VARIABILIS. (Hook.) Caudex long creeping flexuose scarcely paleaceous, fronds distant ; sterile one membranaceous, 6 inches to a foot and 14 inches long (including the decurrent base) 1-2½ inches wide broadly ovato-lanceolate costate acuminate below rather suddenly attenuated and very long decurrent upon the scaleless stipes sometimes almost to the base, the margin subrepand, costules very distinct subhorizontally patent, primary areoles large transversely oblong, secondary ones subquadrangular including free divaricating veinlets ; fertile fronds narrow-linear often 6-10 inches long 2-3 lines wide on very long scaleless stipites often a foot long, sori continuous often spreading over the margin ;—Hook. Sp. Fil. v. 277 ;—Gym. decurrens. *Hook. Gard. Ferns. t.* 6 ;—Acrostichum rivulare. *Wall. Cat. n.* 2165.

The specimen figured is from the Courtallum Forests, it differs from G. Feei in its very prominent costules. I have specimens from Birmah with the costules far more prominent and more regular than those in this figure, but I also have specimens nearly intermediate as to venation between true Feei and variabilis, and I have doubts about the two species being really distinct, the Courtallum plant is much more membranaceous in texture than Feei and the venation is very prominent. Sir W. Hooker refers the Ceylon pinnatifid variety of Feei (Plate CCXI. of Ferns of Southern India) to this species, but it has quite the venation of Feei, each segments of the frond has a costa (as in my three-lobed variety figured in the next plate), but there are no prominent costules.

Hab. Tinnevelly foresta 2—3,000 feet elevation, Assam, Khasya, Penang, Java.

PLATE No. CCLXXII.

Gymnopteris variabilis
(Hook.)

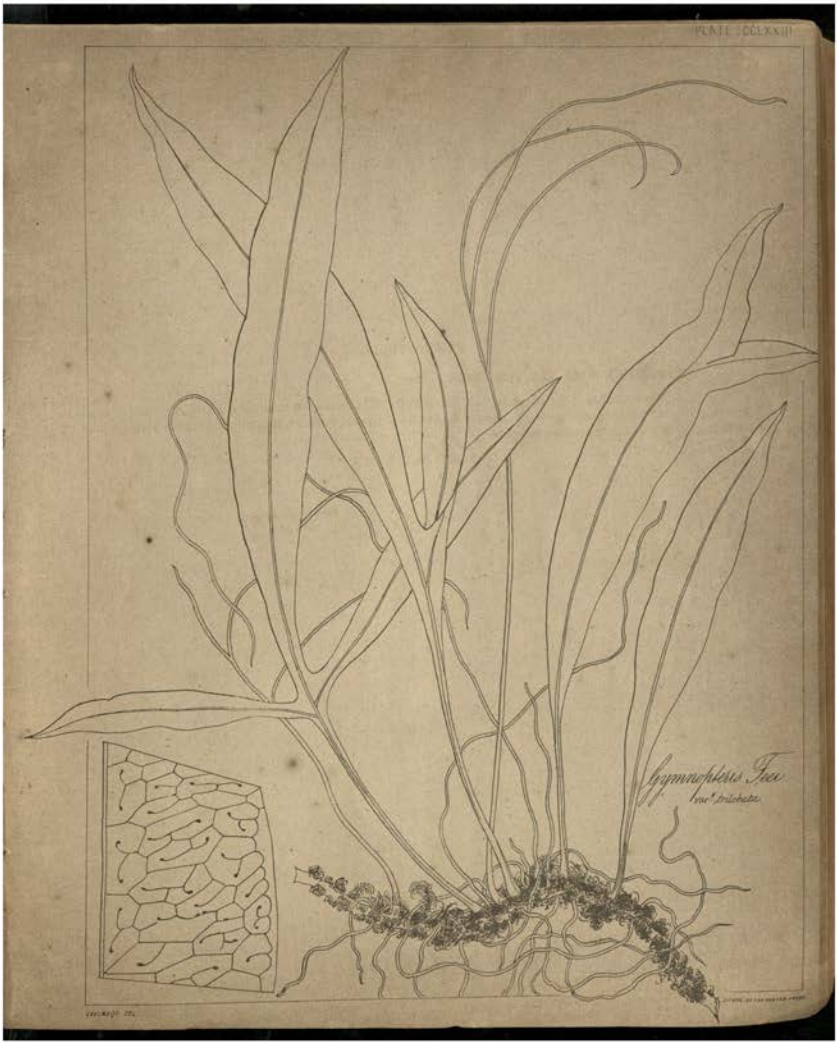
DEVINDER DEL.
LITHOG. BY THE FOLKER PRESS MADRAS.

GYMNOPTERIS.

GYMNOPTERIS FEEI, VAR. TRILOBATA.

This is a curious variety of the common G. Feei (Plate XLVIII of the Ferns of Southern India), I have only found it in the forests of Coorg and South Canara where it is abundant at an elevation of 2,000 to 3,000 feet, both sterile and fertile fronds are generally 3 lobed though they are sometimes simply lanceolate.

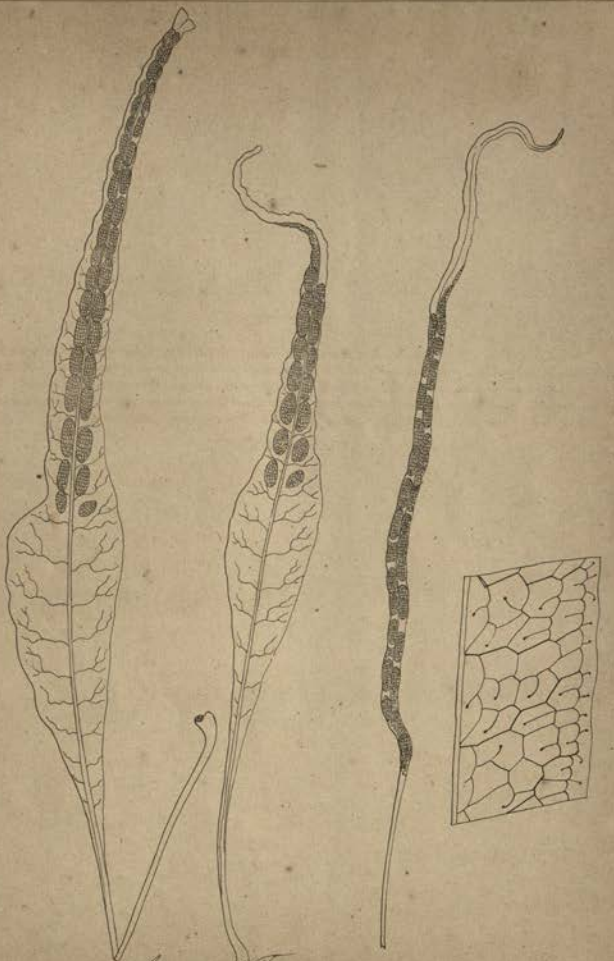
PLATE No. CCLXXIII.


Gymnopteris Feei
var. trilobata

GYMNOPTERIS.

GYMNOPTERIS FEEI. (Moore.) The plate represents some curious abnormal fertile fronds of *Gymnopteris Feei*, they are not uncommon in the large shola at Kodinkarnel on the Pulney mountains and are found growing from the same caudex with the usual sterile and fertile fronds. I have never met with any thing like them elsewhere, though I have searched very carefully in many localities. Mr. Fairbank of the American Mission first drew my attention to them, I have thought them well worth figuring in this work as they might be taken for some new species of Loxogramma if they got into Herbaria apart from the normal form.

PLATE No. CCLXXIV.



Gynopteris Feei.
abnormal forms (Moore)

LONDON DEL.
LITHOG. AT THE FOSTER PRESS, MADRAS.

HYMENOPHYLLUM.

HYMENOPHYLLUM EXIGUUM. (Bedd.) Rhizome creeping pilose, stipes about 1-2 line long, pilose at the base, fronds ¼ to ½ an inch long by 1-2 lines broad linear-oblong entire or slightly repand at the margin, veins pinnate from a central costa simple or forked, spurious venules few but nearly as prominent as the veins not reaching the costa and often not touching the margin, never anastomosing; involucre solitary terminal the base sunk in the frond, valves entire large and spreading receptacle exserted or included.

Hab. On trees in dense forests (3—4,000 feet elevation) Wynaad and Coorg.

Some of the fronds are furnished round the margin with minute brown hair-like appendages, somewhat similar to those met with on Trichomanes Neilgherrense but much smaller, they are not found on all the fronds and are probably minute fungi, the spurious venules in this species are few in number and nearly as prominent as the real veins, in Trichomanes Neilgherrense they are many times thinner than the veins (so fine as only to be visible under a lens,) very numerous and often connected by a waved line near the margin, they are not represented in the figure of that species (Plate VI. Ferns of S. India).

The species here figured has quite as much right to be considered a Trichomanes as a Hymenophyllum as its involucre has a lengthened tube, but I have placed it in Hymenophyllum on account of its being distinctly 2 valved. Whilst this sheet was passing through the press I have received what appears to be the same species from Ceylon collected by Mr. Beckett in the Telganum quage in the Central Provinces, the involucres of the Ceylon specimen are quite exserted beyond the apex of the frond and not sunk in the margin, but Trichomanes Heuzaianum differs in the same way the involucre being sometimes quite exserted and at other time quite sunk in the frond.

PLATE No. CCLXXV.

Hymenophyllum exiguum
[Bedd.]

HYMENOPHYLLUM.

HYMENOPHYLLUM FLACCIDUM. (Van den Bosch.) Caudex creeping furnished with minute golden hair-like scales, stipes 1-2 inch long wiry naked or furnished with a few minute scales, frond oblongo-acuminate 3-8 inches long 1 to 2 inches broad, pinnate, rachis winged throughout and furnished beneath (as are the costa of the pinnæ and veins) with numerous hair-like scales, pinnæ more or less deeply pinnatifid, segments linear flaccid or often crispate, spinuloso-dentate, veins very thick and prominent touching the margin, spurious veaules none, involucres terminal on the segments, oblongo-ovate divided to nearly the base, spinuloso-dentate towards the apex—nearly allied to T. Smithii Hook.

The specimen figured is from Birmah.

Hab. Birmah, Khasya Mountains.

PLATE No. CCLXXVI.

Hymenophyllum flaccidum.

(Vandin Neath.)

COLVINGS DEL.

LITHOG. AT THE TOWER PRESS, SHARPNO

HYMENOPHYLLUM.

HYMENOPHYLLUM SMITHII. (Hook.) Stipes 1-2 inch long wiry naked or slightly tomentose, fronds oblong acuminate 3-8 inches long 2-3 inch broad bipinnatifid; rachis winged above ciliated below; pinnæ oblong-triangular, with a winged rachis, and simple or 1 to 4 times forked linear spinuloso-serrate segments; sori 1 to 4 terminal on the segments of the pinnæ on both sides; involucre oblong small divided about half way down, valves entire. *Hook. Sp. Fil.* 1. *p.* 97;—*Syn. Fil.* 69. Leptocionium serrulatum, Presli, affine, *and* holochilum. *Van den Bosch.*

The figure is taken from Sir W. Hooker's "Species Filicum."

Hab. Malay Peninsula, Java, Philippine Islands.

PLATE No. CCLXXVII.

Hymenophyllum Smithii

(Hook.)

HYMENOPHYLLUM.

HYMENOPHYLLUM DENTICULATUM. (Sw.) Stipes 1-2 inch long erect naked, fronds ovato-triangular, tripinnatifid 2-3 inch long, 1 inch or more broad at the base, rachis margined throughout with a slightly undulated wing, pinnæ slightly crisped, the lower ones rhomboidal, twice as broad as long, deeply cleft with flabellate or pinnatifid linear segments, sori usually single, placed at the axils on the upper side of the pinnæ sometimes recurved, involucre ovate divided about 2-3rds of the way down, spinose on the back with serrulated valves. *Hook. Sp. Fil.* 101 ;—*Syn. Fil.* 71 ;—*Sw. Syn. Fil. p.* 148 *and* 375 ;—Trich: denticulatum *Blume En. Fil. Jav. p.* 226. Hymenophyllum humile *Nees et Bl. in nov. ct. Acad XI. t.* 13. *f.* 3. (Sterile).

The specimen figured is from Moulmein.

Hab. Moulmein 7,000 feet, Java.

PLATE No. CCLXXVIII.

Hymenophyllum denticulatum
(Sw.)

HYMENOPHYLLUM.

HYMENOPHYLLUM NEESII. (Hook.) Stipes 1-2 inches long, naked or slightly winged, with a crispate margin on both sides, fronds ovate about 2 inches long ¾ to 1 inch broad tripinnatifid; rachis winged throughout, the wing and pinnæ much crisped; pinnæ with distant narrow simple or 1-3 times deeply forked deeply toothed segments, sori small usually single, supra-axillary on the upper pinnæ; involucre subcylindrical below; divided more than ½ way down, with 2 acute spinuloso-dentate valves. *Hook. Sp. Fil.* 1-99;—*Syn. Fil.* 71. Hymen. dichotomum *Nees. in Nov. act. acad.* 1823, *p.* 12 *t.* 13 *f.* 4 (*not Cav.*) Trichomanes Neesii. *Bl. En. Fil. Jav. p.* 226;—T. aculeatum *J. Sm. in En. Fil. Philipp.* Leptocionium aculeatum. *Van den Bosch.*

The specimen figured is from Penang.

Hab. Malay Peninsula, Java, Borneo, Fiji, Philippines.

PLATE No. CCLXXIX.

Hymenophyllum Nessii [Hook.]

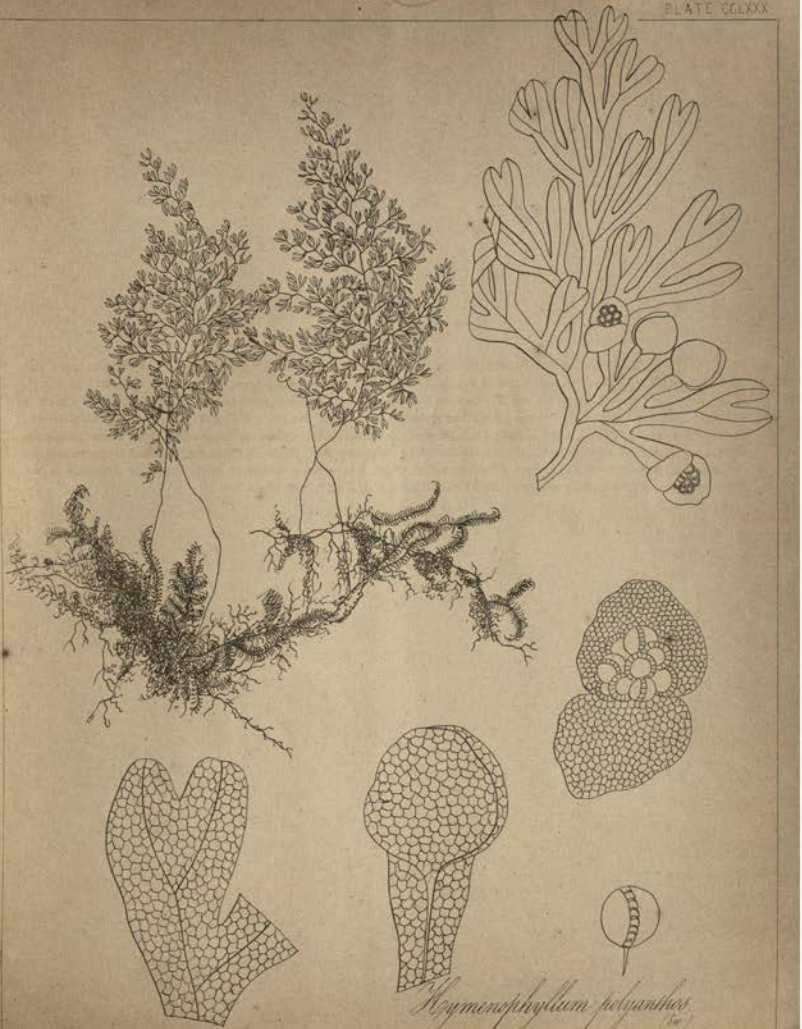
PRINTED AT THE FOUNTAIN PRESS.

HYMENOPHYLLUM.

HYMENOPHYLLUM POLYANTHOS. (Sw.) At plate 267 of the Ferns of Southern India, I have figured under this name a fern from Ceylon which has been named by Van den Bosch, *Hymenophyum macroglossum*, but which is considered by Sir W. Hooker to be only a small variety of the true *H. polyanthos*; as the Himalayan fern is so much longer and finer, I have given a figure of a specimen (from the Khasya hills), but will not offer any opinion as to whether the two are distinct species or only varieties—the Ceylon form I have lately found in the Anamallay and Tinnevelly mountains and elsewhere on the western ghats of our presidency. Sir William Hooker in his Synopsis Filicum includes under his *H. polyanthos* about 30 species of Van den Bosch and amongst others the *H. Blumeanum* Spr. (Plate CCLXVI, Ferns of Southern India), which I have lately discovered on the Tinnevelly mountains (in the Ayen Coyl pass near Courtallum) and have no doubt about its being quite distinct from *polyanthos*.

PLATE No. CCLXXX.

PLATE CCLXXX



Hymenophyllum polyanthos
(Sw.)

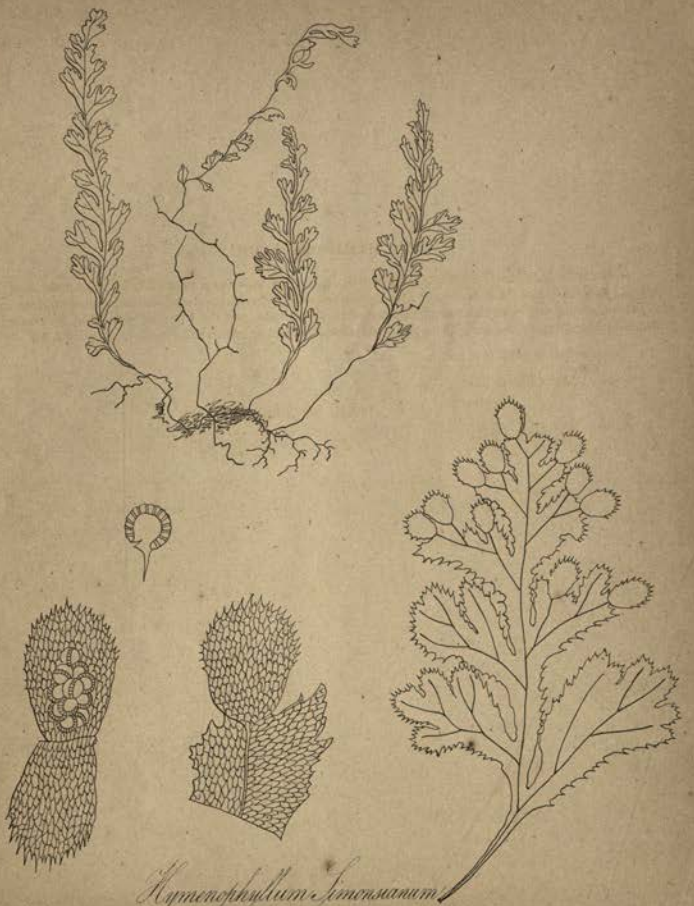
HYMENOPHYLLUM.

HYMENOPHYLLUM SIMONSIANUM. (Hook.) Stipe slender wiry naked 1-2 inches long, fronds linear oblong 2-3 inch long ¾ inch broad, once pinnatifid down to a broadly winged rachis; segments fan-shaped with only shallow divisions directed from the apex towards the base; veins dichotomous, the margins spinuloso-dentate; sori 1 to 4 terminal on the divisions of the upper pinnæ; involucre broadly oblong, divided nearly to the base; valves spinuloso-dentate. *Hook. 2nd. Cent. t.* 13;—*Syn. Fil.* 68.

The specimen figured is from Sikkim.

Hab. Sikkim, Khasya Hills.

PLATE No. CCLXXXI.



Hymenophyllum Simonsianum

(Hook.)

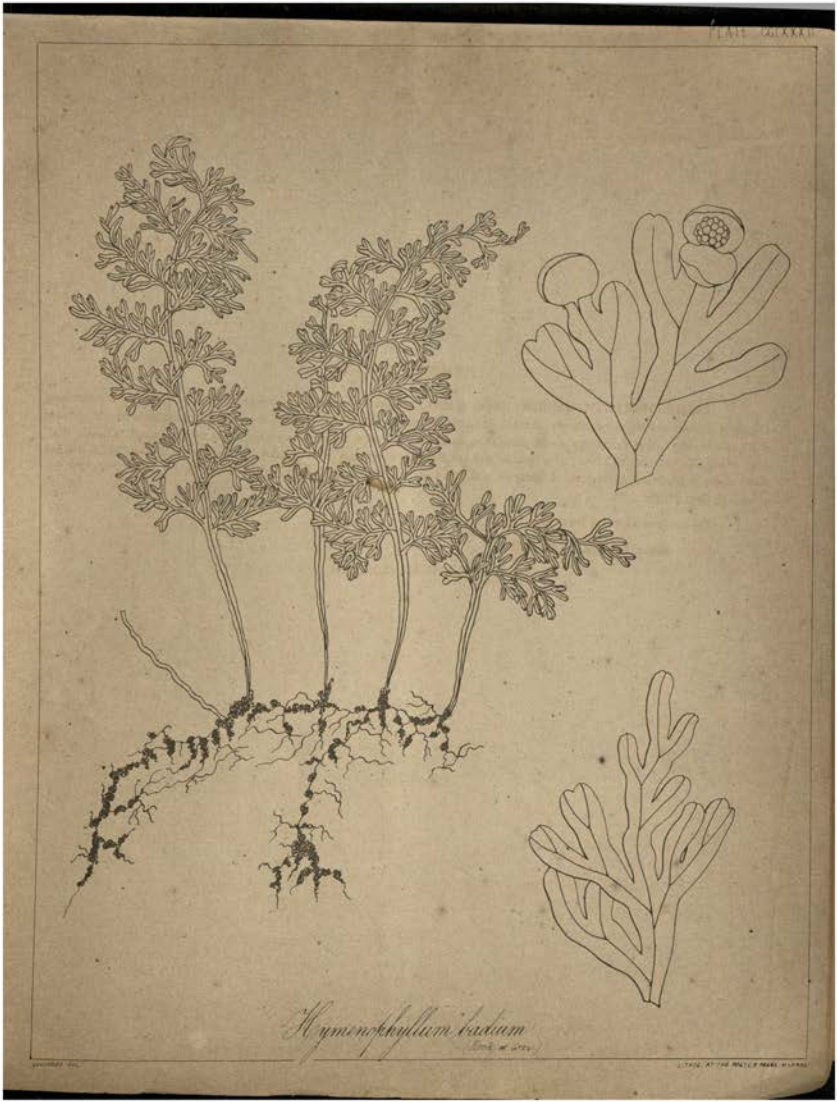
HYMENOPHYLLUM.

HYMENOPHYLLUM BADIUM. (Hook. et Grev.) Stipes 2-3 inches long slender winged above, fronds 4-12 inches long, oblong or ovato-lanceolate, acuminate tripinnatifid; main rachis broadly winged throughout; lower pinnæ lanceolate-rhomboidal, divided down to a broadly winged rachis into several pinnules on each side, the lowest of which are a few times deeply incised, ultimate divisions broadly linear; sori 2-12 to a pinna, terminal and axillary on the segments on both sides; involucre nearly 1 line broad divided down nearly to the base; valves rounded nearly twice as broad as deep, the outer edge denticulate. *Hook. Sp. Fil.* 1. 102. *Syn. Fil.* 60. *Hook. et. Grev. Ic. Fil. t.* 76.

The specimen figured is from Sikkim.

Hab. Sikkim, Nepal, Malay Peninsula.

PLATE No. CCLXXXII.


Hymenophyllum radicum

TRICHOMANES.

TRICHOMANES FILICULA. (Bory.) The fern here figured is the true *Filicula* of Bory,—Plate No. VII of the Ferns of Southern India is the *Schmidtianum* of Van den Bosch and is included by Sir W. Hooker under the *T. pyxideferum* L. and the name on the plate should be altered from Filicula to *pyxidiferum* L. The true *Filicula* is distinguished by having a distinctly two-lipped involucre and belongs to the section or subgenus *Didymoglossum*, but is not otherwise distinguishable from *pyxidiferum*, and I have always looked upon them as the same species, they are both common on the Nilgiris and throughout India. I annex Sir W. Hooker's descriptions of both species with localities.

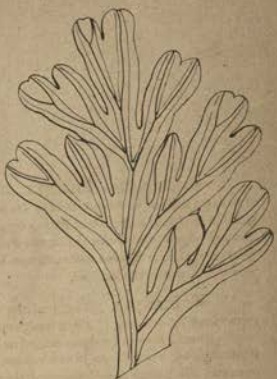
T. FILICULA. (Bory.); rhizome wide-creeping, tomentose, rather slender, stipes 1-2 inch long, naked, slightly winged above; frond 1-4 inch long, 1½-2 inch broad, ovate, tripinnatifid, main rachis with a very narrow wing or free below; pinnæ ovate-rhomboidal, pinnatifid down to a narrowly-winged rachis; the lower pinnule again deeply pinnatifid; ultimate segment linear; texture firm, membranaceous; a central costa in each segment, spurious venules none or indistinct, sori 1 to 4 to a pinna, axillary or terminal on the segments; tube sunk or somewhat exserted, the mouth very distinctly two-lipped, the lips subtriangular with a rounded apex,—Hk. Sp. 1. p. 124. Didymoglossum, Desv.

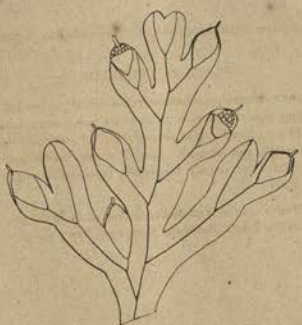
Hab. Mauritius, Bourbon, Madagascar, Natal, Cape Colony and Fernando Po; Nepaul, Assam, Japan, India, Ceylon, Java, Borneo and Polynesian Islands.

PLATE No. CCLXXXIII.

T. PYXIDIFERUM. L.; rhizome wide-creeping, tomentose, rather slender; stipes 1-2 inch long, naked, winged above; frond 1-6 inch long, 1-1½ inch broad, ovato-oblong, tripinnatifid, main rachis with a very narrow wing; pinnæ ovate-rhomboidal, pinnatifid down to a narrowly-winged rachis, with the lower pinnule again deeply pinnatifid; ultimate segment linear, often emarginate at the apex; texture membranaceous; a central costa in each segments; spurious venules none or indistinct; sori 1 to 4 to a pinnæ, axillary, tube more or less winged, mouth broadly dilated but scarcely two-lipped; receptacle filiform, exserted. Hk. Sp. 1. p. 124. Hk. and Grev. Ic. Fil. t. 206.—Ferns of Southern India *t.* vii.

Hab. Tropical America, from Mexico and the West Indies southward to Brazil and Peru; Bourbon, Cape of Good Hope, Angola, Fernando Po, Hindustan as far north as Khasia, Moulmein, Borneo and New Caledonia.





Trichomanes Filicula.

(Bory.)

EDWARD BELL.

LITHOG. AT THE FOSTER PELL, MADRAS

TRICHOMANES.

TRICHOMANES INSIGNE. (Van den Bosch.) This fern is included by Sir William Hooker in his Synopsis under *Trichomanes Filicula*, if a variety of that species it has a distinct habit, so I have figured it.

Hab. N. W. Himalaya (Falconer).

PLATE No. CCLXXXIV.

Trichomanes insigne

(Vanden Bosch.)

LITHOG. AT THE FOSTER PRESS.

TRICHOMANES.

TRICHOMANES PLICATUM. (Van den Bosch.) This is the Trichomanes Filicula var. *β-late-alatum* of the Synopsis Filicum (Hooker), it differs from *Filicula* in the ultimate segments of the pinnules being very narrow and acute and the wing of the rachis being somewhat crispid, I find the spurious venules the same in both species or varieties, but Hooker states that they are distinct in this and wanting or indistinct in *Filicula*.

The specimen figured is from Birmah.

PLATE No. CCLXXXV.

Trichomanes plicatum

(Vanden Bosch)

LITHOGRAPHIC PRESS, MADRAS.

TRICHOMANES.

TRICHOMANES KURZII. (Bedd.) Rhizome stout creeping, stipe 2-4 lines long, fronds ½ to ¾ inch long, 2-3 lines broad, very irregularly pinnatifid with the linear segments of different lengths, sori solitary terminal on several of the segments; base of the involucre sunk in the frond, no lips, veins a single central costa to each segment.

Hab. Phœnix Bay, S. Andaman (Kurz.)

PLATE No. CCLXXXVI.

Trichomanes Kurzii (Bedd.)

Govindoo, del. Dunphy, Lith.

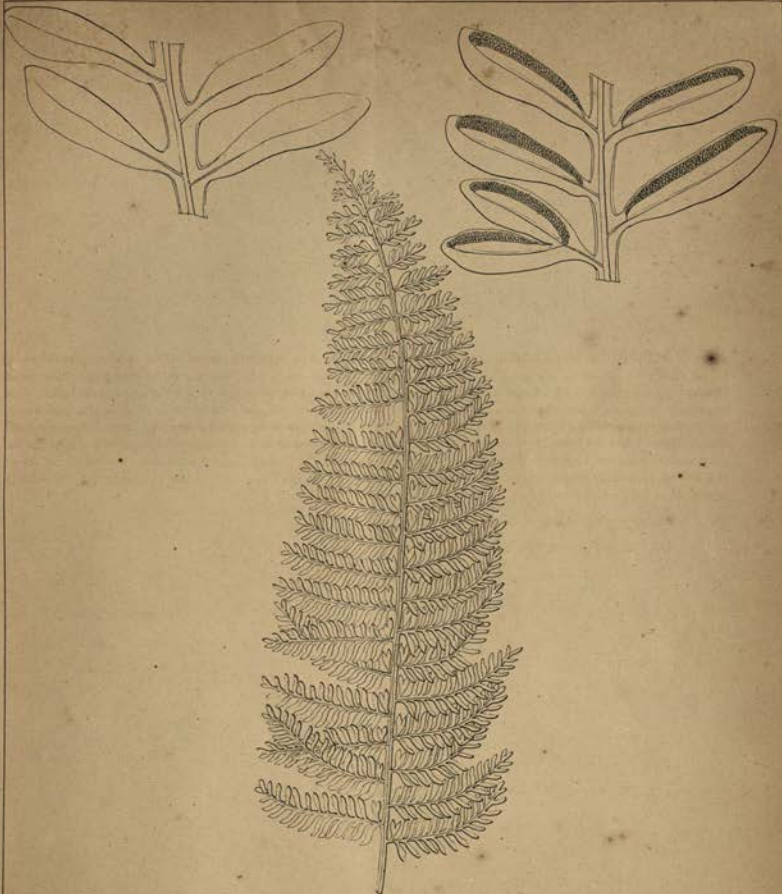
ASPLENIUM.

ASPLENIUM BELANGERI. (Kze.) Caudex short, stout erect, apparently formed of the united stipites and roots, stipites densely tufted, 4 inches to a span long, compressed upwards greenish, fronds 1-1½ foot long narrow-oblong (the sides almost forming a parallelogram) acuminated only at the apex, sparingly stellato-squamulose beneath, here and there proliferous, subchartaceous, pale-green, bipinnate, primary pinnæ from 1-2 inches long, horizontally patent, singularly uniform in the whole length, linear obtuse nearly sessile again pinnated (or they may be said to be deeply pinnatifid,) pinnules or segments 2-3 lines long linear-clavate or subspathulate obtuse straight or a little curved decurrent with the rachis simple monosorous or the lowest superior one is bifid or subpinnatifid, veins solitary central, sori large conspicuous, occupying nearly the length of the pinnule, marginal, involucres, color and texture almost of the frond, main rachis compressed, partial ones distinctly winged. *Hook. Sp. Fil.* iii. 209;—*Kze. Bot. Zeit.* vi. p. 176;—Darea furcata, *Bl. p.* 207;—Aspl. Veitchianum, *Moore*;—Aspl. decorum, *Kze. Bot. Zeit.* vi. 176.

The specimen figured is from the Malay Peninsula.

Hab. Malay Peninsula, Java, Borneo, Sumatra.

PLATE No. CCLXXXVII.



Asplenium Belangeri (Kze.)

Govindoo del.

Dunphy, Lith.

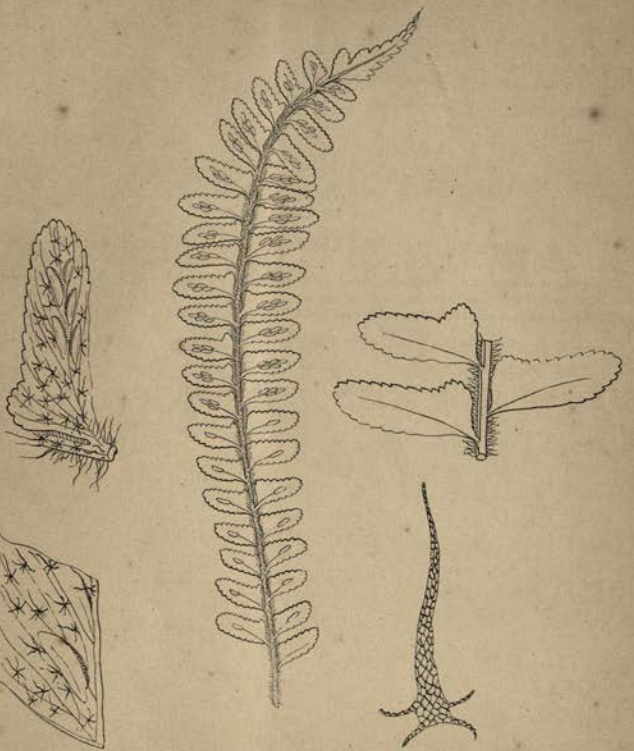
ASPLENIUM.

ASPLENIUM SUBAVENIUM. (Hook.); frond (a portion only) a span long lanceolate coriaceo-chartaceous, very opaque, pinnated, pinnæ ½ of an inch long, numerous approximate horizontal sessile oblong obtuse, upper half obscurely serrated, cuneate at the base, superior base truncated subauriculate, inferior margin cut off as it were by a straight line, terminal pinna elongated pinnatifid below, costa and veins sunk obsolete, sori 2-6 oblong oblique, occupying the disc of the frond between the middle and the apex, involucre firm-membranaceous, rachis ebony-black terete rigid sparsely setose. *Hook. Sp. Fil.* iii. 143.

The figure is taken from Hooker's "Species Filicum."

Hab. Penang, Madagascar.

PLATE No. CCLXXXVIII.



Asplenium subavenium (Hook.)

Goodden del.

Bromley, Lith.

DIPLAZIUM.

DIPLAZIUM SUBSERRATUM. (Bl.); caudex "creeping elongated," fronds membranæous 1½ foot long an inch to an inch and a half wide, glabrous and satiny, elongato-oblong lanceolate sharply acuminate moderately attenuated below, obtuse or acute at the base, towards the middle sinuato-crenate coarsely dentato-serrated nearer the apex, costa slender firm prominent beneath, veins fascicled horizontal or nearly so, one to three of the exterior branches soriferous, sori distant often curved, involucres frequently diplazioid, narrow-linear, occupying about two-thirds of the space between the costa and margin, stipes 1-2 inches long slender terete. *Hook. Sp. Fil.* iii. 236;—*Bl. En. p.* 174—*Mett. Aspl. p.* 90.

The figure is taken from Hooker's "Species Filicum."

Hab. Penang, Java.

PLATE No. CCLXXXIX.

Diplazium subserratum (Bl.)

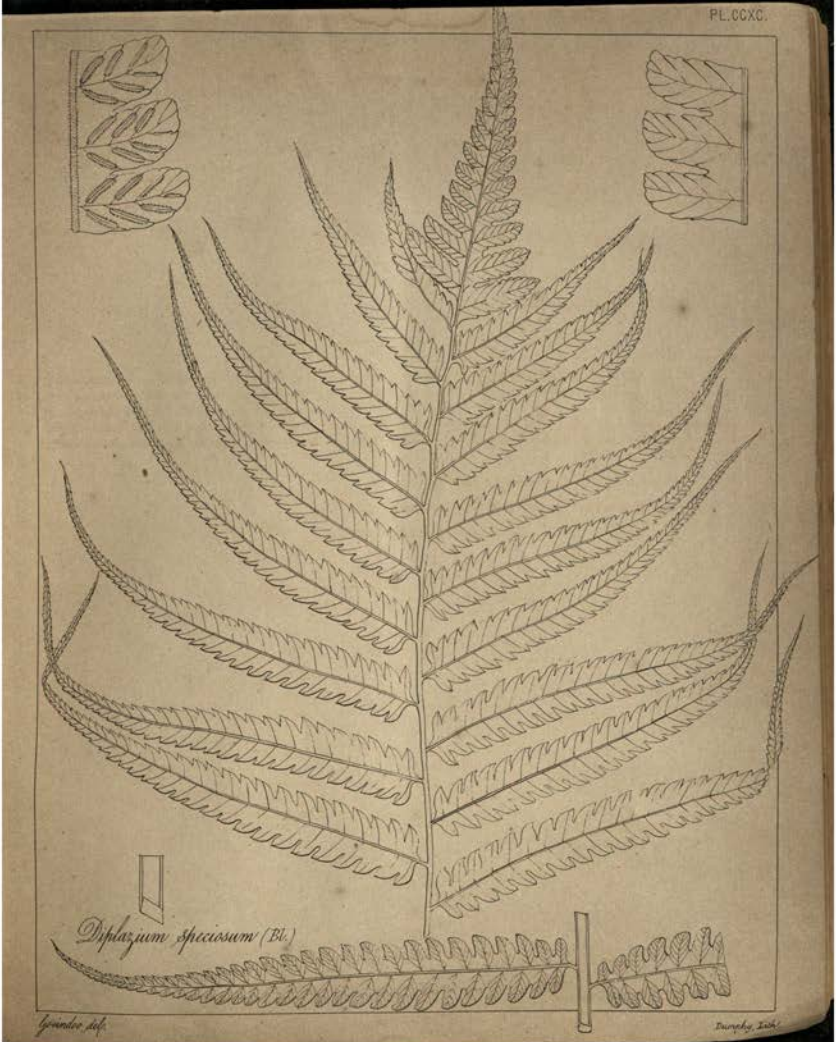
DIPLAZIUM.

DIPLAZIUM SPECIOSUM. (Mett.); stipes tufted, 1 foot or more long, firm, erect, straw-colored or brownish, nearly naked; frond 1-2 feet long, 8-12 inch broad, with 10-20 pairs of pinnæ below the pinnatifid apex, the lower ones often stalked, 4-6 inch long, 1-1½ inch broad, the apex much acuminated, the edge lobed, the lobes reaching down two-thirds of the way to the rachis or more, close, ¼ inch broad, slightly toothed, the base truncate or slightly cuneate; texture herbaceous, but firm; rachis erect, naked; veins pinnate in the lobes; sori slender, reaching nearly to the edge. Diplazium, *Blume*;—A. acuminatum, *Wall. Mett.* (non H. and **A.** *Hook. Syn. Fil. p.* 235.

The specimen figured is from the Malay Peninsula.

Hab. Malayan Peninsula, Java, Hong-Kong, Philippines.

PLATE No. CCXC.



Govindoo del.

Dumphy, Lith.

DIPLAZIUM.

DIPLAZIUM THWAITESII. (A. Br.) Caudex long, creeping, black rooting, stipites scattered 4 inches to a span long, and as well as the main rachis woolly with crisped hairs mixed with lanceolate membranaceous scales, fronds a span to a foot long, ovate-lanceolate acuminate, membranaceous, pinnate, pinnatifid at the apex, pinnæ 1½-3 inches long, approximate, sessile, horizontal, lanceolate, obtuse, straight, deeply almost to the rachis pinnatifid with short-oblong obtuse lobes, toothed at the apex, veins pinnated simple or forked, sori in two oblique rows in each lobe, rather small linear-oblong, involucres pale-brown, membranaceous, convex, eroso-ciliate, and diplazioid, but far more generally asplenioid, costæ and veins above subglandularly and very sparsely hirsute. *Hook. Sp. Fil.* iii. 250;—*A. Braun. Ind. Hort. Berol.* 1857.

The specimen figured is from Ceylon. It is nearly allied to D. lasiopteris, and until I lately received copious specimens from Mr. Thwaites, I had referred it to that species.

Hab. Ceylon.

PLATE No. CCXCI.

Diplazium Thwaitesii (Hook.)

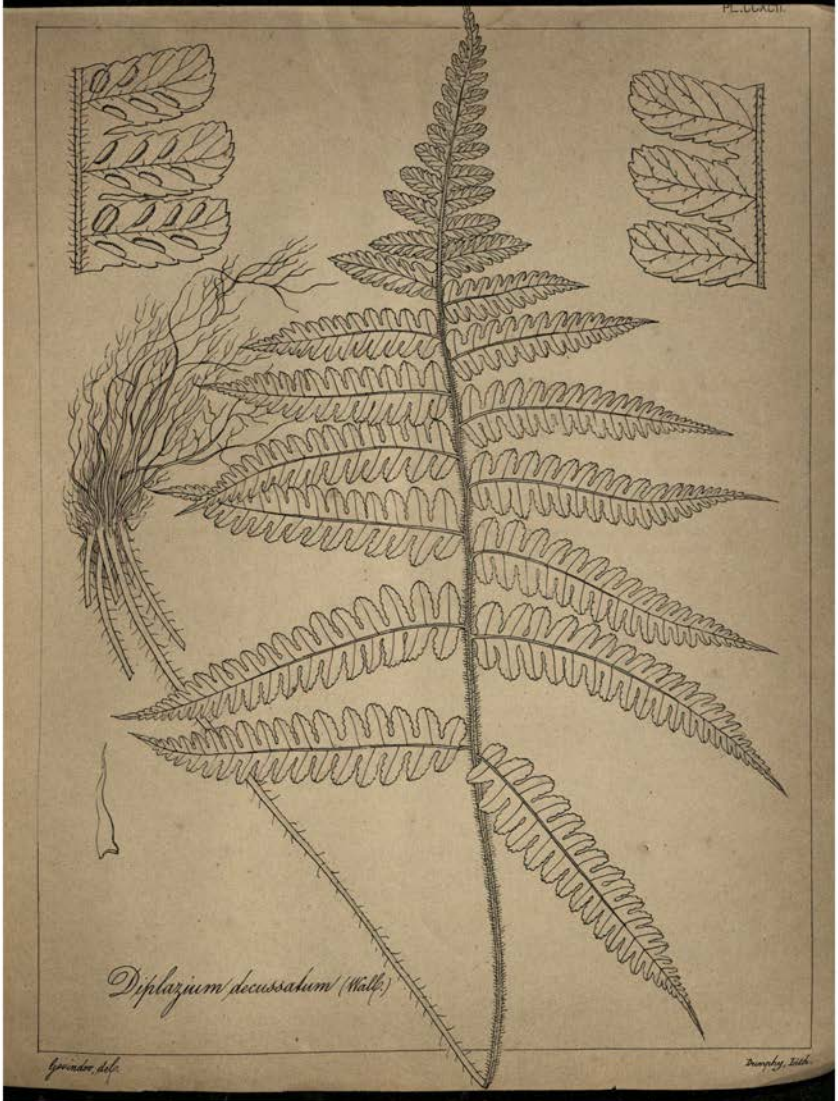
DIPLAZIUM.

DIPLAZIUM DECUSSATUM. (Wall.) Caudex erect, stipes 12-16 inches long scaly towards the base, fronds 8-10 inches long, 6-8 inches broad at the base, deltoid ovate, pinnate; pinnæ about 8 on each side alternate (below the pinnatifid apex) lower ones petiolate, middle ones sessile, upper decurrent, 3-4 inches long ½ to nearly 1 inch broad, pinnatifid 2-3rds down to the costa, segments with a very rounded apex toothed at the margin, veins straight or more or less flexuose, veinlets 5-6 on each side of the segment, alternate or opposite, generally simple, sometimes forked, reaching the margin or terminating just within it; rachis costa and veins sparingly furnished with setaceous hairs, sori lower ones double, upper single. Wall, Cat. No. 2208.

The specimen figured is from Ceylon (C. P. 3951) and I have lately found it on the Tinnevelly hills; it is nearly allied to D. lasiopteris but has a different caudex. Mr. Baker refers it to Diplaz. Schkuhrii, *Hook.* Pl. 230 of this work, and places both under D. Japonicum *Thunb*, which has a creeping caudex. The species that I have figured as D. Schkuhrii has an erect caudex but is bipinnate in its larger fronds which this species appears never to be.

Hab. Ceylon, Tinnevelly Hills, Himalayas.

PLATE No. CCXCII.



Diplazium decussatum (Wall.)

Govindoo, del.

Dumphy, lith.

DIPLAZIUM.

DIPLAZIUM POLYPODIOIDES. (Mett.) This species differs from the plant figured at Plate CLXIII of the Ferns of Southern India in the midrib of the segments, being given off at an acute angle instead of at nearly a right angle, and the segments of the pinnules being wider, it is named by Mr. Moore at p. 335 of his "*Index Filicum.*" Diplazium polypodioides var. *β.* major, but there is evidently some confusion in the species or varieties of this group as Mr. Moore gives D. asperum and arborescens and two varieties of polydioides as from Ceylon or Southern India. Plate No. CLXIII. above alluded to is I believe the D. asperum of Blume (and the name on the plate should be altered); it is however included by Sir W. Hooker under "polypodioides," it has numerous asperities on the main and secondary rachis, which are wanting in this species, and has more veinlets in each segment. Authentic specimens of D. arborescens, which I have received from the Mauritius do not differ from some Indian forms of the plant here figured, and I have certainly only two varieties or species (if they are distinct) from Southern India.

The specimen figured is from the Himalayas (Col. Dyas.)

Hab. Himalayas, Ceylon (C. P. 1852), Southern India.

PLATE No. CCXCIII.

Diplazium polypodioides (Mett.)

Gounodec del. Dumphy, lith.

DIPLAZIUM.

DIPLAZIUM ASSIMILE (Endl.); stipes 1½ to 2 feet long, fronds glabrous, deltoid, membranceous flaccid, tripinnate, primary pinnæ nearly opposite towards the base of the frond, alternate nearer the apex, lower ones up to 12-15 inches long by 6 inches broad, secondary pinnæ 2 to 3½ inches long by ½ to 1½ inch broad, gradually acuminated, tertiary pinnæ a little more than ½ an inch long by ¼ inch broad, lower one subsessile upper decurrent, almost a parallelogram in shape with a broad rounded apex, divided ½ or 2 3rds of the way to the costa into about 5 segments on each side, segments slightly falcate entire or generally with one toothlet on the upper margin and rarely one on the lower, veins forked or pinnate, double sori numerous, involucre elongated membranaceous not breaking but quite that of Asplenium and Diplazium;—Asplenium assimile;—*End. Fl. Norf.* 10—*Moore Ind. Fil. p.* 114;—Athyrium assimile, *Presl.*

This species has been included by Sir W. Hooker in his Species Filicum under Athyrium Australe Brack (which is united with umbrosum J. Sm. by Mr. Baker) it however has a quite different involucre to the South Indian species figured under that name at Pl. CLVIII. Ferns of S. India, and it is more flaccid and delicate and is tripinnate (subquadripinnate) with the ultimate segments subentire, whereas A. Australe is bipinnate (subtripinnate) with ultimate pinnules much toothed, these latter differences however are not always constant, or much to be depended upon as a specific difference in large compound ferns of this sort, as young or even small grown specimens may be bipinnate when larger specimens of the same species are tripinnate.

The specimen figured is from Ceylon (Central Provinces.) (Col. Perad 1,347.)

PLATE No. CCXCIV.

Diplazium assimile (Endl.)

Govindoo, del. Dumphy, lith.

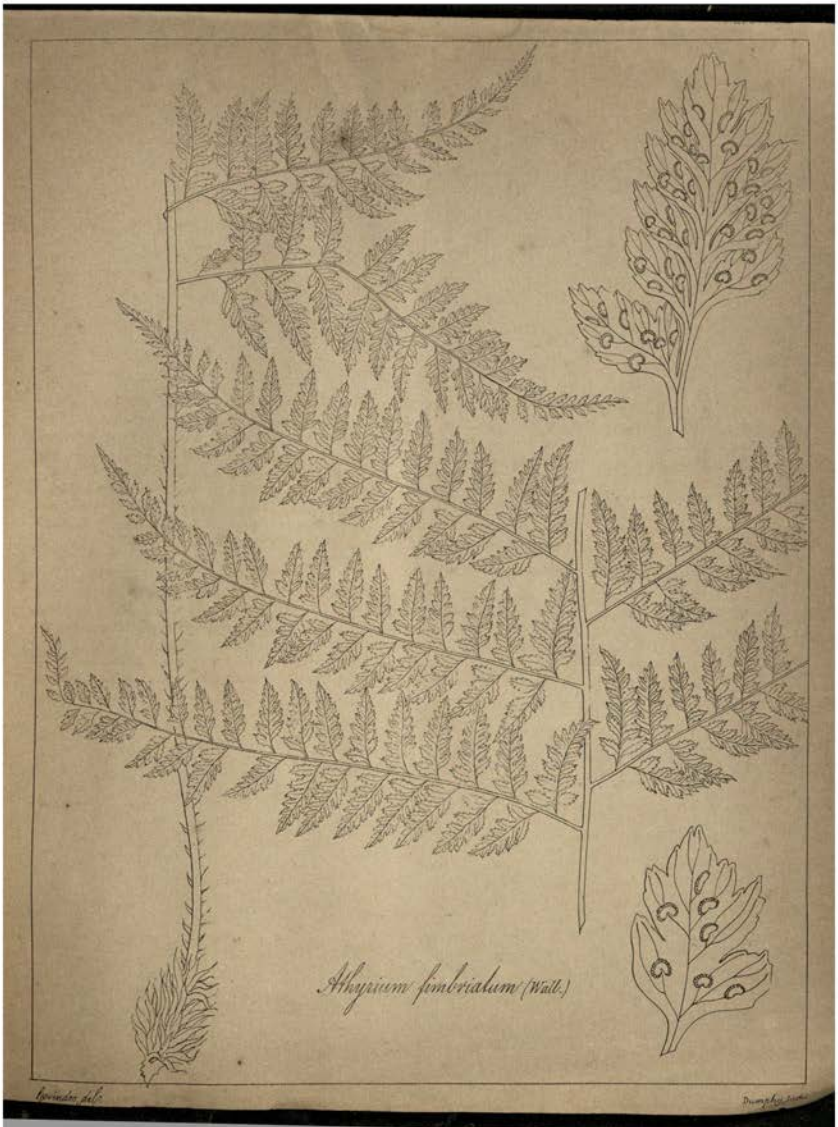
ATHYRIUM.

ATHYRIUM FIMBRIATUM. (Wall.) Caudex? stipes stout darkish-brown glossy, 1 foot and more long, copiously paleaceous, most so towards the base with large glossy tawny lanceolato-subulate scales, frond ample 2-3 feet long ovate or subdeltoid, acuminate firm-coriaceous, subpolystichoid, 4 pinnate, primary pinnæ petiolate (as are the secondary and tertiary ones) 6-12 inches long distant from a broad base lanceolate much acuminate, secondary ones also distant of the same shape but not acuminate, 1-1½ inch long numerous, ultimate pinnules ovato-lanceolate, ¼ of an inch long, superior basal one the largest acute, all pinnatifid with acute lobes, auricled at the superior base, terminal ones subconfluent, sori 2-5 on each pinnule broad-oblong or in age almost globose, very prominent and copious, involucre brown membranaceous, broad, generally crescent-shaped or subhippocrepiform fimbriated extremely convex, soon forced back by sori, rachises all pale-brown, glossy more or less flexuose. Aspidium fimbriatum, *Wall. Cat. n.* 339; *not* Athyrium foliolosum, *Moore Ind. Fil. p.* 92;—An Aspl. decipiens, *Metten. Asplen. p.* 195. *t.* 6. *f.* 9, 10;—*Hook. Sp. Fil.* iii. 234.

The specimen figured is from Kumaon.

It is scarcely distinct from some forms of the common Nilgiri fern which I have figured at Plate CLV. of the Ferns of Southern India as A. pectinatum (Wall.), but which is A. aspidioides (Schlecht). Sir W. Hooker refers the pectinatum of Wall. to A. Filix-fœmina, but some authentic specimens that I have seen of pectinatum are not to be distinguished from our Nilgiri fern; there are several forms of it on the Nilgiris, and the more I study this group I am inclined to think that the different forms of Filix-fœmina-pectinatum or aspidioides and fimbriatum (and perhaps some other species) run so one into the other that it is almost impossible to distinguish them satisfactorily and that the only chance of doing it would be by a careful examination of numerous plants growing in their natural habitatats.

PLATE No. CCXCV.


Athyrium fimbriatum (Walt.)

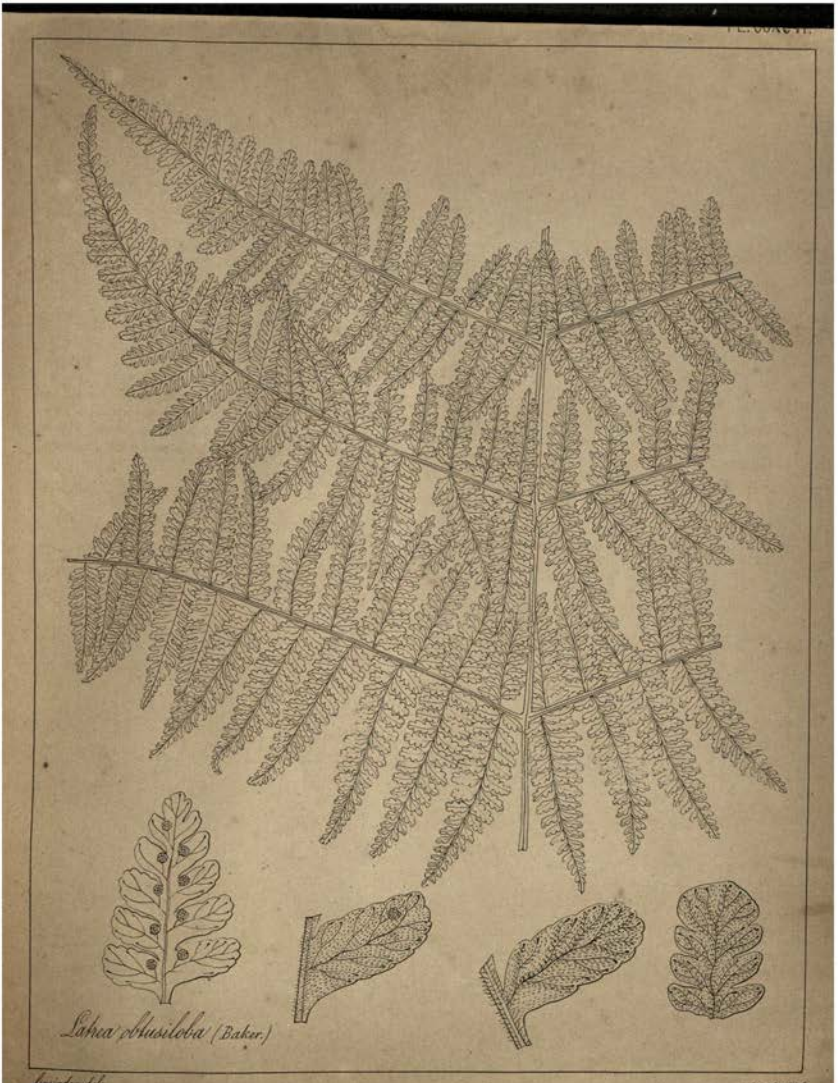
LASTREA.

LASTREA OBTUSILOBA (Baker); stipes 1-2 feet long, firm, erect densely clothed with large, ovate, concolorous scales; frond 3-4 feet long; 1½-2 feet broad; lower pinnæ often 1 foot long 6 inch broad; pinnules lanceolate, most of the segments of the lower ones distinct, ovate-oblong, cut down to the rachis into oblong-rhomboidal entire lobes, the largest ¼ inch deep, ⅛ inch broad; texture herbaceous, turning blackish when dried; rachises slightly scaly, the upper ones, and especially the under surface, more or less glandular; lower veinlets of the entire lobes forked; sori medial. *Hook. Sp. Syn. Fil. p.* 284.

The specimen figured is from Ceylon (C. P. 3142), it is nearly allied to L. ferruginea (*Bald.*) and to L. Blumei *Hook.* (which is the "intermedia" of Blume).

Hab. Ceylon (at Newera Ellia and Maturatte).

PLATE No. CCXCVI.


Lathea obtusiloba (Baker.)
Govindoo, del.
Dunphy, Lith.

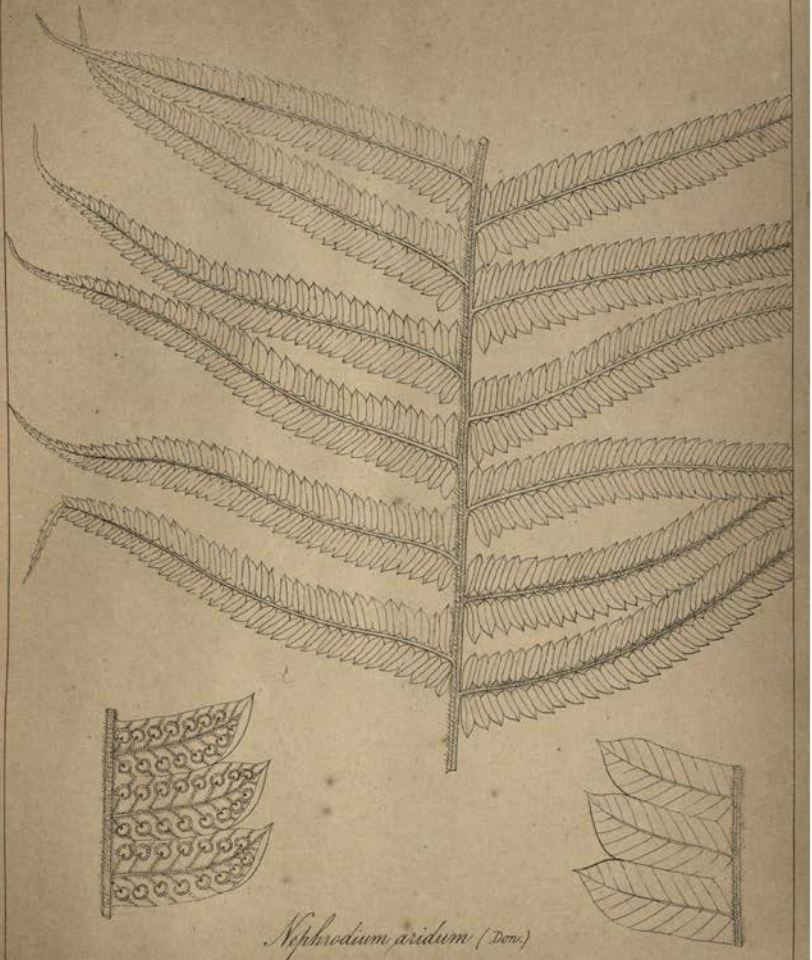
NEPHRODIUM.

NEPHRODIUM ARIDUM. (Don.); stipe 1 foot or more long, erect, naked; frond 3-4 feet long 12-18 inch broad; pinnæ 6-9 inch long ¾-1 inch broad, cut about one-third of the way down into subtriangular sharp-pointed lobes; texture coriaceous; rachis and lower surface naked or slightly hairy; veinlets 8-10 on a side; sori in rows about midway between the midrib and edge: capsules naked.—Aspid. *Don. Prod. Fl. Nep. p.* 4;—**A.** venulosum, *Wall.*;—A. obscurum *Bl.*;—*Hook. Syn. Fil. p.* 291.

The specimen figured is from the Himalayas. It is included by Sir W. Hooker in the "Sp. Filicum" under Nep. unitum; but separated in the "Synopsis."

Hab. North India, Malay Peninsula, Philippines.

PLATE No. CCXCVII.



Nephrodium aridum (Don.)

Spreckley del. Dampkey Lith.

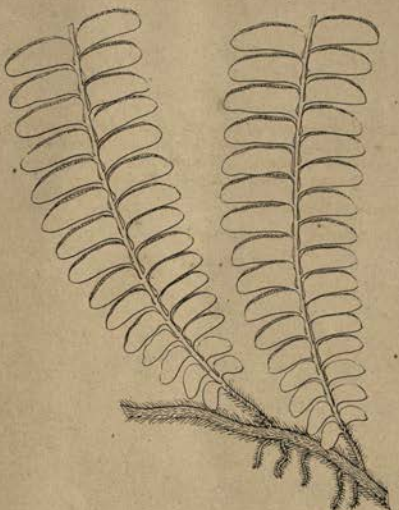
LINDSŒA.

LINDSŒA SCANDENS. (Hook.) rhizome stout, wide creeping, scandent, paleaceous; frond 9-12 inch long, 1½-1 inch broad, simply pinnate; pinnæ ¾ inch long, ½ inch broad, the lower line slightly decurved, the upper rounded, entire, the point broadly rounded, placed in a long row close together, but not imbricated; texture pellucido-herbaceous; costa marginal; veins free ¾ sori in a continuous marginal line. *Hook. Sp.* 1. *p.* 205 *t.* 63. *B.*;—*Syn. Fil. p.* 106.

The figure is taken from Sir W. Hooker's "Sp. Fil."

Hab. Malay Peninsula, Philippines, Luzon, Isle of Leyti.

PLATE No. CCXCVIII.



Lindsæa Scandens (Hook.)

Grimdor del.

Dumas

SCHIZOLOMA.

SCHIZOLOMA CORDATA. (Gaud.) Rhizome short-creeping, stipe 3-6 inch long, slender, erect, wiry; barren frond 2-3 inch long 1-1½ inch broad, cordate-oblong, quite entire, fertile one 3-6 inch long, linear entire or forked; texture coriaceous; sori in a continuous marginal line, veins anastomosing.—*Hook. Sp.* 1. *p.* 219. *t.* 66 *A.*

The figure is taken from the "Sp. Filicum."

Hab. Malay, Peninsula.

PLATE No. CCXCIX.

Schizoloma cordata (Gaud.)

Govindoo del.

Dunaghe sc.

LYGODIUM.

LYGODIUM POLYSTACHIUM. (Wall.) Stem creeping slightly pilose, fronds conjugate pinnate, membranaceous, pinnæ petiolate furnished with a tufted gland at the apex of the petiole, deltoid-ovate to lanceolate, glandular, pilose on the rachis of pinnæ, costa and veins pinnatifid more than half down to the costa, segments with a rounded apex, entire or slightly crenate, costa of the pinnæ and central vein (or costule) of segments flexuose, veinlets simple or forked, fertile segments contracted.

The specimen figured is from Birmah (Parish.)

Hab. Birmah, Malay, Peninsula.

PLATE No. CCC.

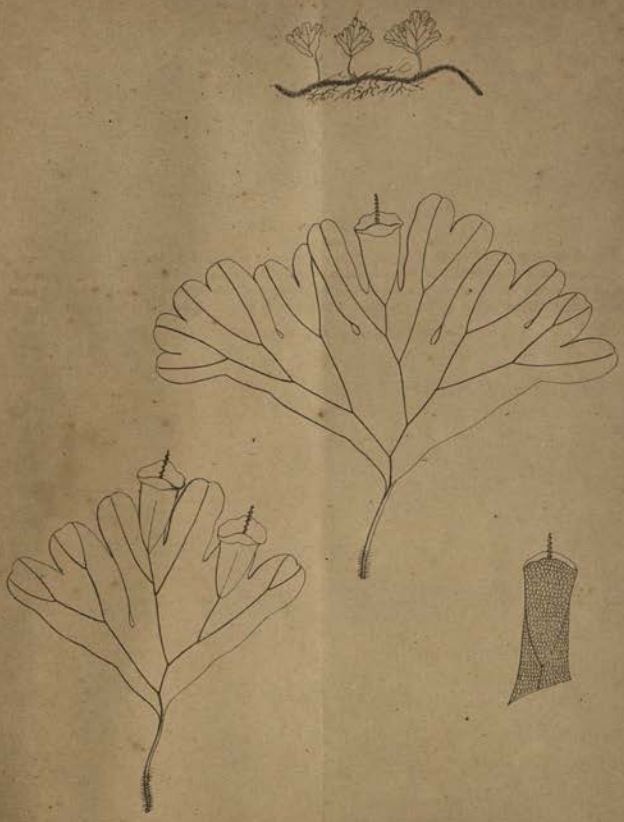
Lygodium polystachyum (Wall.)
Grundor del.
Dumphy Lith.

TRICHOMANES.

TRICHOMANES DIGITATUM. (Swartz.) Stipe slender naked or hairy at the base ½ an inch long; frouds glabrous or ciliate up to 2 inches long by ½ to 1 inch broad, very irregular in general outline, more or less deeply pinnatifid, segments 1-4 fid, lobes rounded obtuse with a single vein to each, no spurious vemules, sori terminal in the segments, involucre cup-shaped quite sunk, the mouth dilated, slightly 2-lipped. *Hook. Sp. Fil.* i. *p.* 119;—T. lanceum. *Bory.*;—T. flabellatum and nitidulum. *Van den Bosch.*

Hab. Northern India, Mauritius, Bourbon, Java, and Polynesian Islands.

PLATE No. CCCI.



Trichomanes digitatum (Sw.)

Gonzalez del. Dwyer Lith.

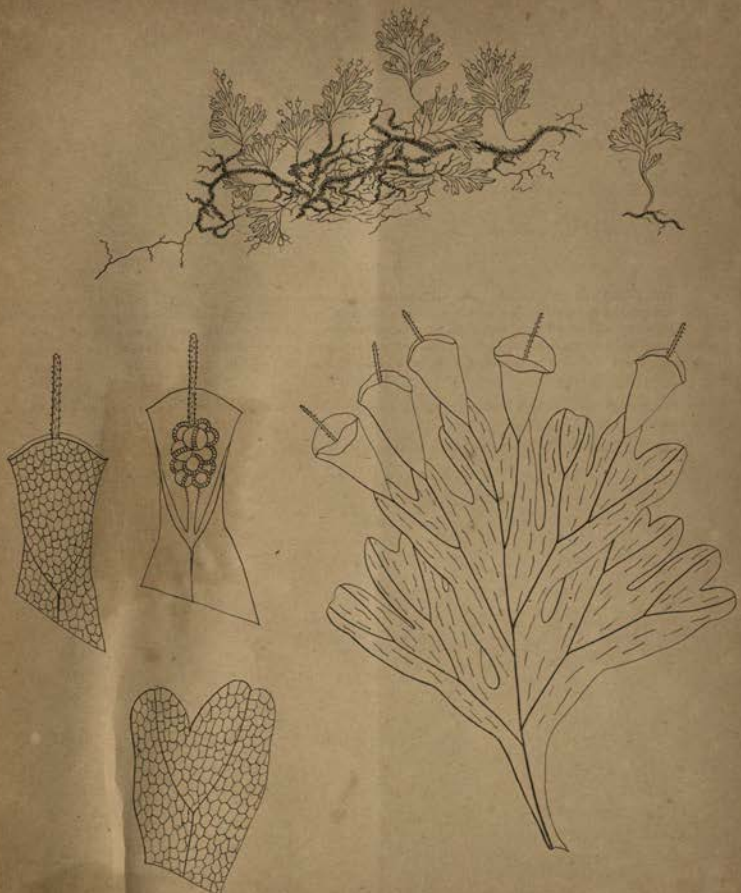
TRICHOMANES.

TRICHOMANES PUSILLUM. (Sw.) Rhizome creeping tomentose; fronds with a broadly winged stipe, generally about 1 inch long, very irregular in general outline, more or less deeply pinnatifid nearly down to the midrib; segments again more or less deeply divided obtuse and rounded at the apex of the segments, veins erecto-patent from a central costa, 1 to each lobe of the segments; spurious venules lineolate numerous, very short and detached, sori numerous terminal at the apex of the lobes, tube almost entirely exserted, only the base being sunk in the margin of the frond, mouth dilated. *Sw.*;—*Hook. Sp. Fil.* i. p. 117;—Trich. quercifolium. *Hook and Grev. Ic. Fil. t.* 115.

The specimen figured is from Moulmein (Parish); it has been published under the name of T. viridans by Kuhn Linnæa, 1868, p. 389.

Hab. Moulmein, Tropical South Africa, from Mexico and the West Indies to Brazil, and Peru, Kranz Kop Natal.

PLATE No. CCCII.



Trichomanes pusillum (Sw.)

Comadoo, del. Dumphy, Lith.

TRICHOMANES.

TRICHOMANES HENZAIANUM. (Parish.) Rhizome creeping tomentose, stipes 1-2 lines long, fronds up to ¼ an inch or a little more long, very thin in texture, orbicular to linear, sub-entire to trifid and variously lobed; veins thick and prominent, but often tapering off and thin towards the margin; spurious venules very numerous, no marginal band of reticulations, involucres 1—6 to each frond, terminal and entirely sunk in the frond; the mouth free and more or less 2-lipped. *Parish in Hook. 2 cent. Ferns t.* 1;—*not Bedd. Ferns of British India, pl.* 183, *which is* T. Motleyi.

The specimen figured is from Birmah, (Moulmein and Pegue).

Fig. *a*. The nominal form; *b*. magnified fronds of the same.

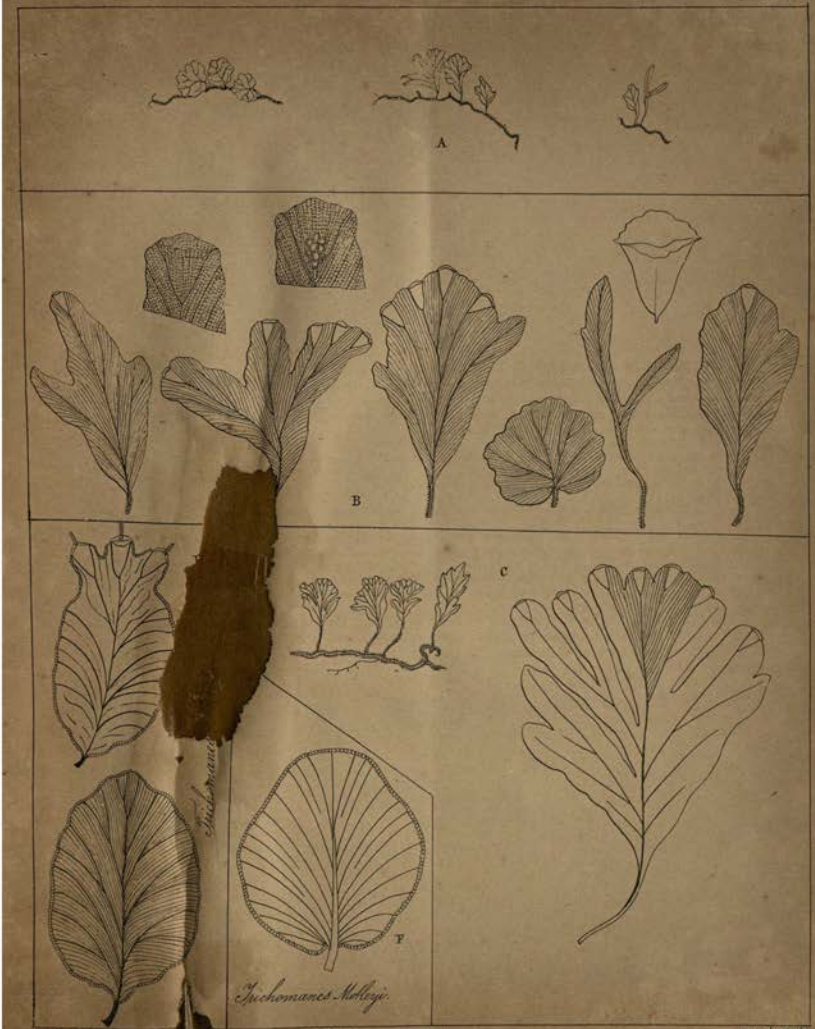
„ *c*. A larger variety.

„ *d*. A magnified frond of T. Neilgherrense from Ceylon, (T. muscoides. Thw. [illegible]) shewing that the spurious venules are fewer than in the Nilgiri plant, but that the same marginal band is [illegible].

„ *e*. A magnified frond of T. Neilgherrense from the Nilgiris, shewing the numerous [illegible] venules, and marginal band not correctly shewn in the figure in the *Ferns of Southern India* (Pl. VI.).

„ *f*. A magnified frond of T. Motleyi (Van den Bosch) from Birmah, shewing the few spurious venules which are sometimes present though sometimes wanting, and which are not represented in Pl. 183 of this work, where this species is figured under the name of T. Henzaianum. It has just been discovered in Ceylon by Mr. Thwaites, and is also found in Borneo and New Caledonia.

PLATE No. CCCIII.



Trichomanes Henzaianum (Prisbe)

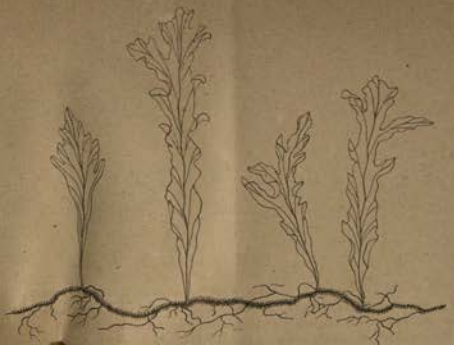
TRICHOMANES.

TRICHOMANES MUSCOIDES. (Sw.) Rhizome creeping tomentose, frond shortly stalked 1-3½ inches long, ¼ to ½ inch broad, varying from linear to suborbicular in outline, and from subentire to variously lobed or pinnatifid, veins prominent and thick, spurious venules very numerous and running at the margin into a vein and marginal band of reticulations (as in Neilgherrense); sori 1-8 terminal on the lobes, tube sunk in the frond, mouth free but scarcely 2-lipped. *Hook. Sp.* i. p. 117;—*Syn. Fil.* 75.

Hab. Northern India, Tropical America, Polynesia, Africa.

Trichomanes Neilgherrense may probably be a small form of this species.

PLATE No. CCCIV.



Trichomanes muscoides (Sw.)

Gonzalez del.

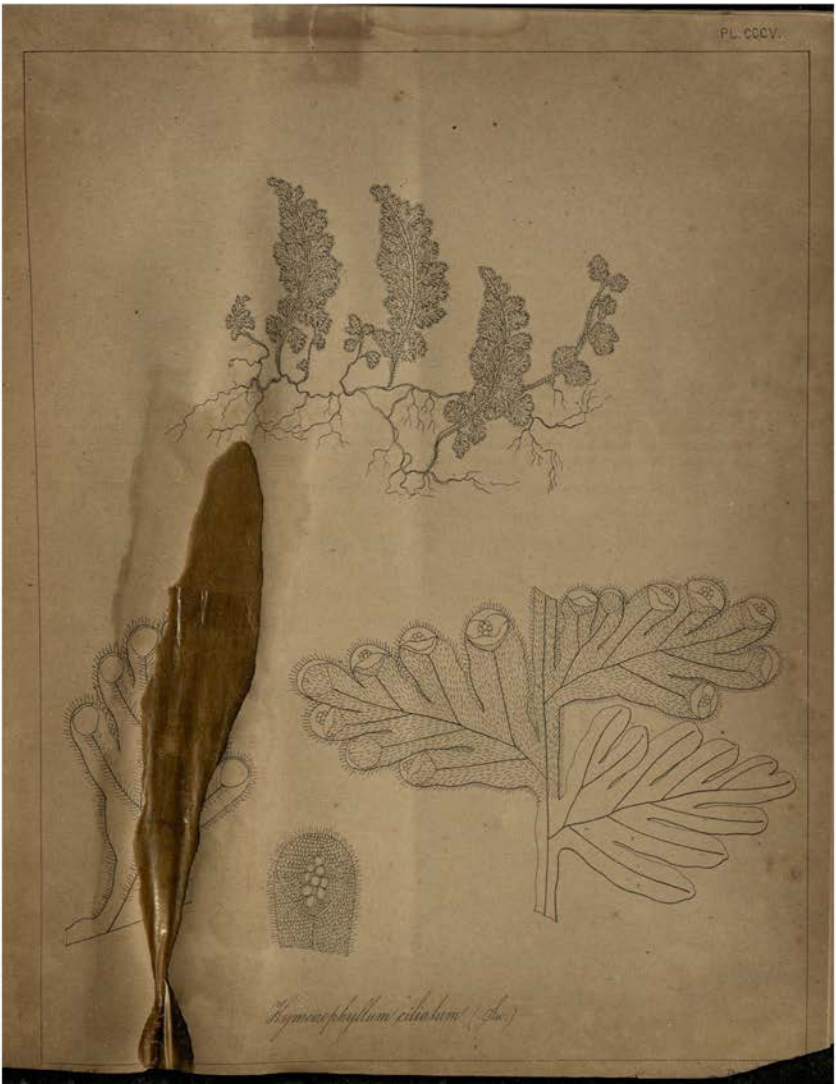
Sumpho Lith.

HYMENOPHYLLUM.

HYMENOPHYLLUM CILIATUM. (Swartz). Stipes 1-2 inches long, very hairy, ciliated, and decurrently winged above, fronds oblong acuminate pinnatifid, with the pinnæ again pinnatifid; 2-6 inches long 1-2 inches broad at the centre, main rachis broadly winged throughout, pinnæ oblong or rhomboidal cut down into simple or forked linear oblong segments, sori 2-12 on a pinna at the apex of the segments; involucre immersed suborbicular, valves divided above half way down and ciliate. *Hook. Sp. Fil.* i. 88; *—Syn. Fil.* 63 *and* 451;—H. Boryanum. *Willd.*;—*Hk. Sp.* i. 89 *t.* 31 *c.*;—H. Plumieri. *Hook. and Green* [illegible] *t.* 123.

Hab. Sikkim—Himalaya, Tropical America, West Tropical Africa, Zanzibar, Mau[illegible]gascar, Bourbon, Seychelles. Johanna Island.

PLATE No. CCCV.



Hymenophyllum ciliatum (Sw.)

HYMENOPHYLLUM.

HYMENOPHYLLUM POLYANTHOS. *vary β. minor.* (Bedd.) Stipes 1-2 inches long slender naked sometimes winged towards the apex, fronds 2-4 inches long about 1 inch broad flaccid, ovato-oblong tripinnatifid, rachis naked winged throughout, pinnæ nearly horizontal, triangular-rhomboidal, about ½ inch long, divided down to a narrowly winged rachis into several pinnules, the lower of which are cut into several simple or bilobed obtuse lobes; sori terminal on the lobes of the upper pinnules, involucre divided more than half way down, the valves rounded or pointed entire.

This is perhaps a distinct species from the Himalyan and Burmese polyanthos, figured [illegible] of this work.

The specimen figured is from the Anamallays.

Hab. Anamallays 6,000 feet; common on trunks of trees near the head of the Torai[illegible]ylon, C. P. 3279.

PLATE No. CCCVI.

Hymenophyllum polyanthos (var. B minor Bedd.)

Govindoo, del.

Dumph.

LASTREA.

LASTREA CANA. (Wall. 1) Stipes densely tufted, 6-8 inches long, slender finely villose; fronds pinnate 8-12 inches long 3-4 inches broad, slightly villose on both sides, central pinnæ 2 inches long, $\frac{1}{4}$ inch broad, gradually narrowed from the base to the apex, cut down nearly to the rachis into close entire or slightly crenated lobes $\frac{1}{6}$ of an inch broad; lower pinnæ distant and dwindling down gradually, texture herbaceous, rachis slender finely villose, veinlets 6-8 on each side of the costule simple; sori medial or submarginal, involucre thin fugacious. Wall. *Baker Syn. Fil.* 267.

The specimen figured is from the Himalayas, (Dr. Thomson.)

Hab. Himalayas.

PLATE No. CCCVII.

Lastrea cana (Baker.)

Baker del. Dwinghy, Lith.

LASTREA.

LASTREA SERICEA. (J. Scott.) Rhizome erect tufted paleaceous furnished with numerous wiry roots, fronds 9-13 inches long about 3-4 inches broad, oblongo-lanceolate pinnate with the pinnæ pinnatifid, membranaceous, rachis pubescent; pinnæ 1½-2 inches long, subsessile oblong from a broad base subacute, pinnatifid about half way down to the costa (lower pairs deflexed); costa pubescent on both sides and primary veins furnished with a few hairs, segments oblong obtuse slightly falcate, crenate, ciliate, veins pinnate, veinlets 5—7 pairs to each segment alternate or opposite simple or occasionally forked, slightly thickened at the apex, the 3-4 lower pairs soriferous a little above the base—indusium glabrous.

The specimen figured is from Chittagong, (J. Scott.)

PLATE No. CCCVIII.

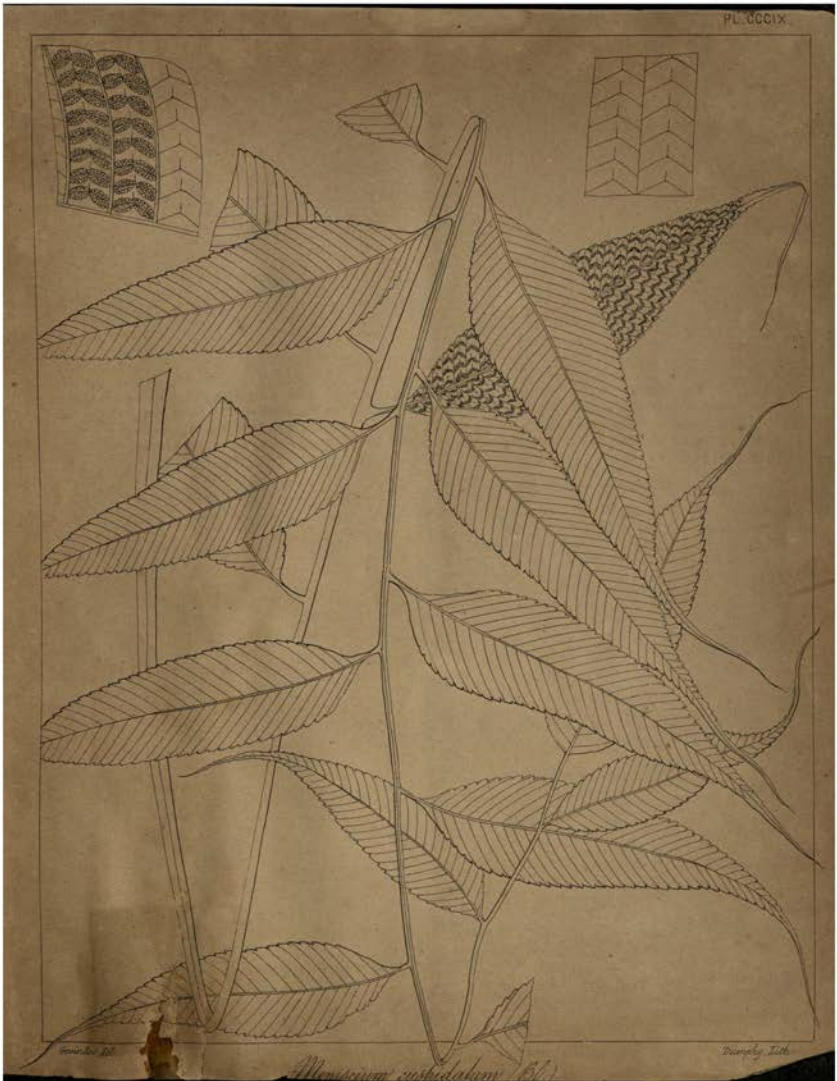
MENISCIUM.

MENISCIUM CUSPIDATUM. (Bl.) Stipes 1-2 feet long stout naked; fronds 2-4 feet long 1 foot or more broad, pinnæ glabrous rather distant petioled lanceolate attenuated at both ends, ending in a very long acumination 6-9 inches long, 1-3 inches broad crenate at the margin, texture subcoriaceous, veins approximated, connivent; transverse veinlets from 6 to 20 pairs on each side, vennles generally free and not joining the base of the areoles above them: sori copious, entirely covering the transverse veinlets. *Baker Syn. Fil. p.* 392;—*Blume t.* 45.

The specimen figured is from the Himalayas.

Hab. Himalayas, Malacca, Philippines.

PLATE No. CCCIX.



Gauntlet del. Dumphy Lith.

Menispermum cuspidatum (Bl.)

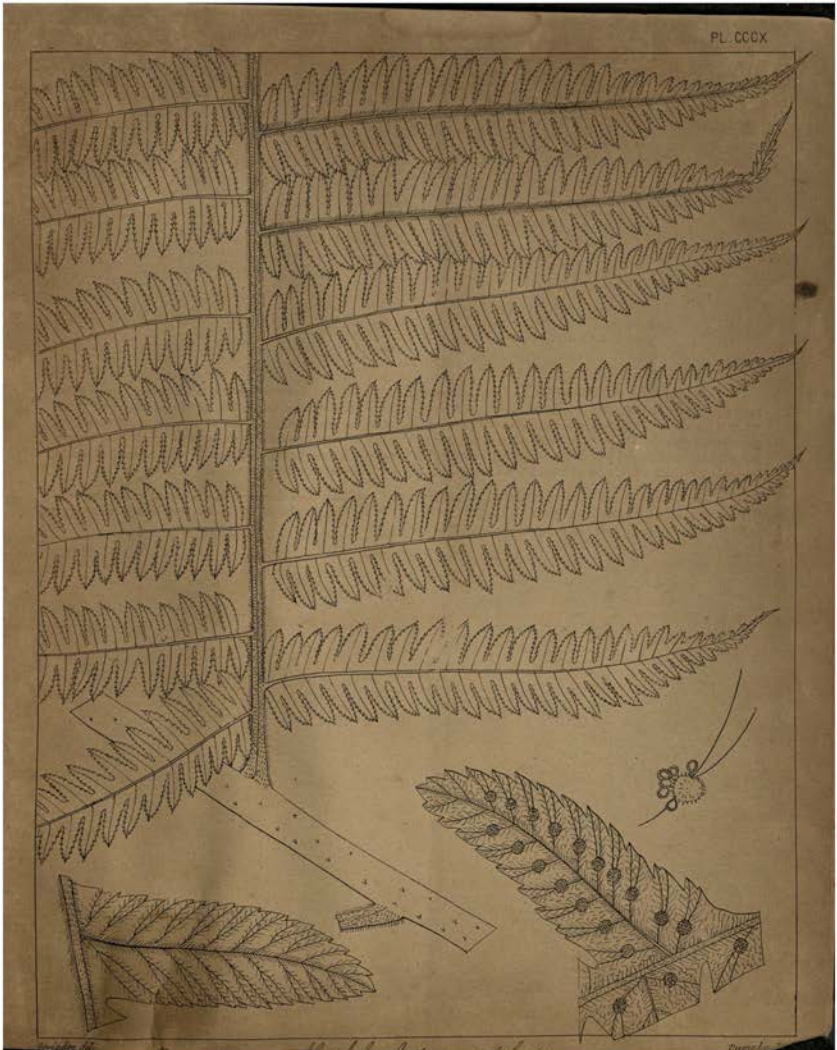
ALSOPHILA.

ALSOPHILA ANDERSONII (J. Scott.) Arborescent, stipes muricato-asperous ebeneous, rather densely clothed below sparingly upwards with lanceolate-subulate deciduous scales, main rachis slightly scabrous below, and as well as the partial rachis tawny villous above, fronds bipinnate ovato-lanceolate herbaceo-membranaceous pilose, primary pinnæ oblongo-lanceolate, acuminate, pinnules oblongo-lanceolate, pinnatifid nearly down to the pilose rachis, with an attenuate serrated apex, segments broad-oblong slightly falcate gradually attenuated towards the apex, sharply serrated, veinlets simple or once forked, 10-12 pair to each segment, all except the upper 2-3 with a single sorus a little below the middle, veins copiously and veinlets sparingly furnished with long weak hairs.

The specimen figured is from Sikkim (Dr. Anderson), where it has lately been discovered in the tropical valleys about the Government Cinchona Gardens, at an elevation of 1,000 to 2,500 feet. It has been introduced into the Botanical Gardens in Calcutta, and was named by Mr. J. Scott. It is called "Pulai nock" by the Lepchas.

PLATE No. CCCX.

PL. CCCX



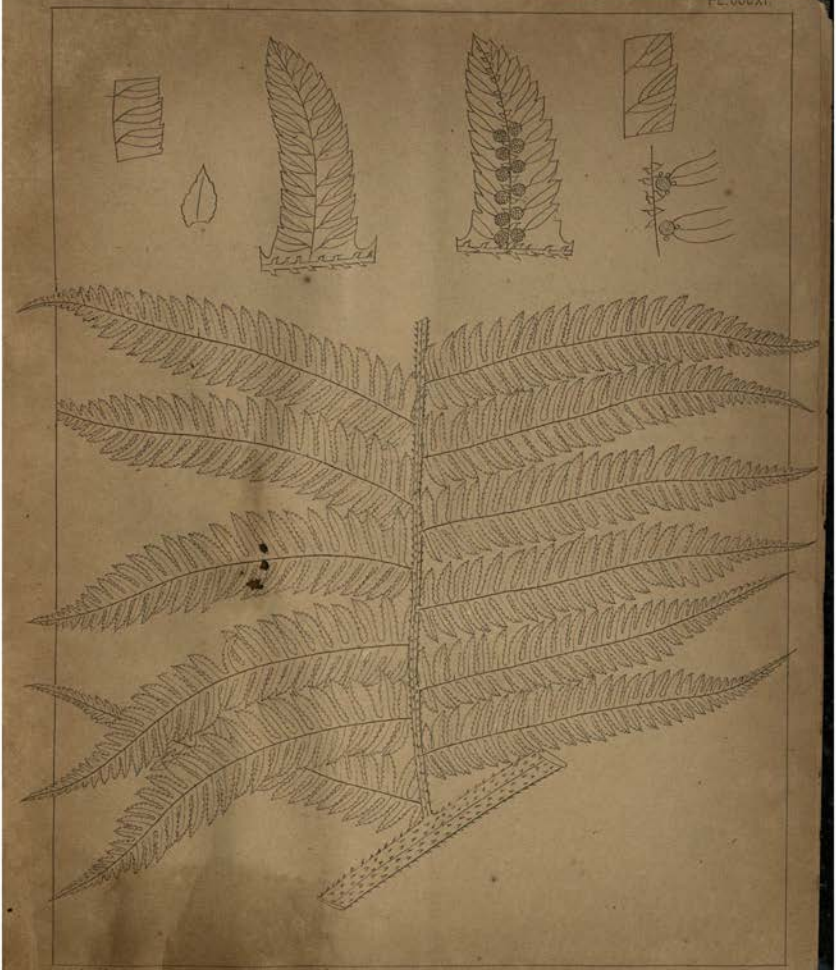
ALSOPHILA.

ALSOPHILA DECIPIENS. (J. Scott.) Arborescent, stipes strongly aculeated, of a mahogany-brown color and at the base paleaceous, muricated furfuraceous and of a pale brown color upwards; fronds coriaceous glabrous greyish green (not glaucous) beneath partial rachis muricate and the costules of the pinnules and segments furnished with small membranaceous scales, primary pinnæ oblongo-lanceolate, acuminate pinnules pinnatifid down to nearly the rachis, segments linear oblong, acute falcate and serrated, with the margins more or less recurved particularly in the fertile ones, which thereby appear narrower than the others; veins forked or doubly forked or pinnate with 3, 4, 5 veinlets, sori close to the costule.

The specimen figured is from the tropical forests of Sikkim at an elevation of 2,000 feet above the sea, where it was lately discovered by Dr. Anderson and introduced into the Calcutta Botanical Gardens; it has been named by Mr. J. Scott. It is called "Pugsheck nock" by the Lepchas.

Alsophila Brunoniana, Plate LXXXVI of this work (a bad figure of a poor specimen), is probably the same as Alsophila contaminans. The Alsophila contaminans is called "Pulai" by the Lepchas; Als. glabra, "Pulai keep;" Alsophila comosa, "Puskea;" and Alsophila latebrosa, "Pugajeek."

PLATE No. CCCXI.



Alsophila decipiens (G. Scott.)

CYSTOPTERIS.

CYSTOPTERIS SETOSA. (Bedd.) Caudex ? stipe scaly 12-14 inches long, frond ample 1-3 feet long by 12-15 inches broad membranaceous, ovate, ovato-oblong or deltoid, tripinnate with tertiary sessile pinnules pinnatifid, main and partial rachises scaly and segments furnished on both sides sparingly with longish weak shining hairs or nearly glabrous, primary pinnæ opposite or subopposite, 1-5 inches wide, linear lanceolate to oblong, secondary pinnæ alternate or opposite, in the more compound parts 1-2 inches long with sessile pinnules, which are again deeply pinnatifid into 5-6 segments, segments crenated or entire, veinlets simple or forked soriferous about the middle, involucre very membranaceous small scale-like ovate roundish ovate to oblong from a broad base fornicate not nearly covering the sorus fimbriate at the margin or entire, soon disappearing.

This is the Fern figured at Plate 262 of this work as Lastrea setosa, (drawn from [illegible] specimens from the Moulmein mountains). I have just received fine young specimens from Dr. Jerdon collected in Sikkim, which only shew that it is not a Lastrea but a Cystopteris; so I publish a fresh plate. The involucre proceeds from below the sorus and [illegible] not cover it in its youngest state. The plant mentioned under Lastrea scabrosa at page 283 of Hooker's Synopsis Filicum is probably [illegible] species.

Hab. Moulmein mountains, Sikkim—Himalaya.

PLATE No. CCCXII.

Cystopteris setosa (Bedd.)

Govindoo del. Dumphy Lith.

MICROLEPIA.

MICROLEPIA PTEROPUS. (Bedd.) Caudex stout creeping, densely clothed with brown very membranaceous smooth scales, stipes 10-15 inches long furnished as are the main and secondary rachises with a few scales similar to those on the caudex, fronds deltoid ovate coriaceo-membranaceous, tripinnate 20-25 inches long, 10-15 inches broad; main rachis winged towards the apex, primary pinnæ petiolate alternate gradually acuminated from the base, rachis winged from the apex to nearly the base, secondary pinnæ alternate petiolate, with their rachises winged to the base and puberulous on both sides, especially above, and furnished with a few scales in under side; tertiary pinnæ acuminate pinnatifid nearly to the base, segments acute much larger on the upper margin pinnatifid, slightly puberulous on the costa, veins pinnate, sori 1-10 on each segment of the tertiary pinnæ, involucre subreniform fimbriated.

Hab. Himalayas (Dr. Jerdon.)

PLATE No. CCCXIII.

DRYNARIA.

DRYNARIA RIGIDULA. (Sw.) Rhizome stout creeping, the scales fibrillose dark glossy brown ; fronds dimorphous the barren ones sessile, 6-9 inches long 3-4 inches broad, cut down $\frac{1}{3}$, $\frac{1}{2}$ way to the rachis into blunt lobes, the fertile ones 2-4 feet long 12-18 inches broad, long-stalked pinnate ; pinnæ 1 inch or more apart articulated on the rachis, oblongo-linear narrowed and stalked at the base 6-12 inches long $\frac{1}{4}$-$\frac{3}{4}$ inch broad, the point acuminate, the edge more or less deeply inciso-crenate, texture subcoriaceous, rachis and both sides naked, main veins not distinct to the edge, veinlets forming copious areoles, free veinules few ; sori immersed in a single row nearer the costa than the margin, with corresponding pustules on the upper side.—*Sw.*—*Hook. Sp. Fil.* v. *p.* 98 ;—*Syn. Fil. p.* 368 ;—Polyp. diversifolium. *R. Br.*

The specimen figured is from Malacca.

Hab. Malacca and Malay Islands, Tropical Australia, Tropical Pacific Islands, Norfolk [illegible]

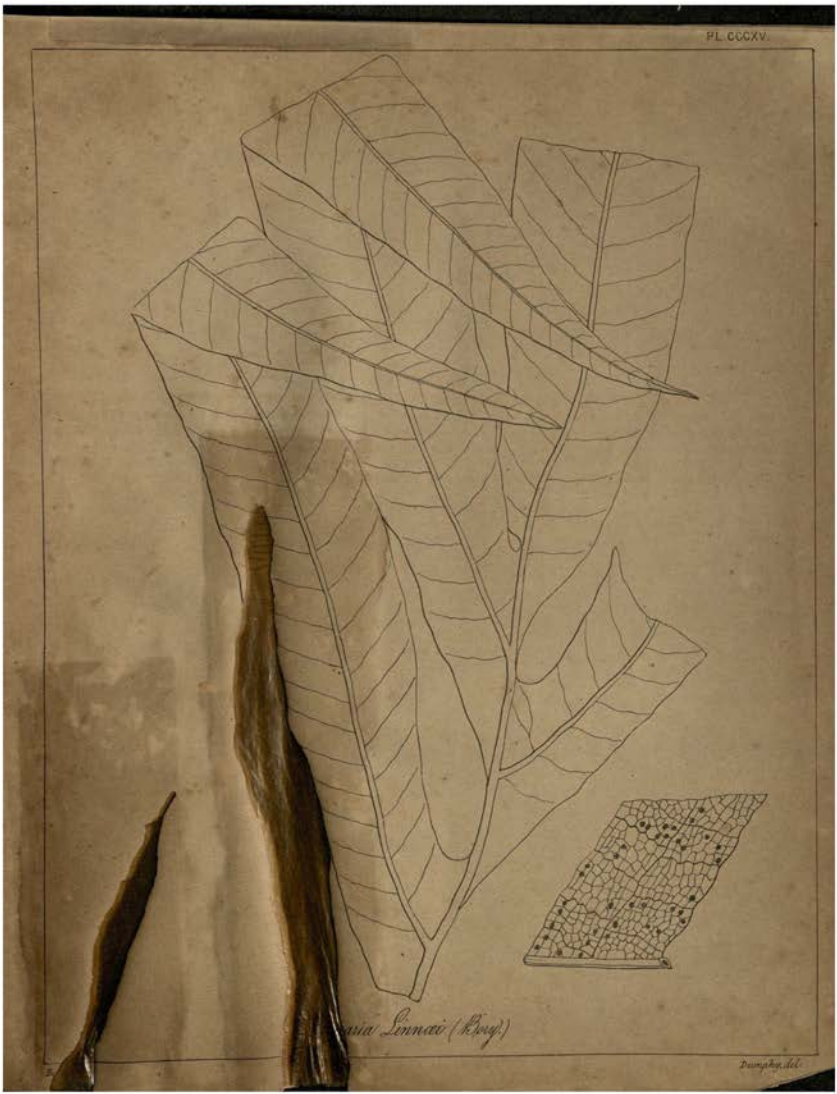
PLATE No. CCCXIV

DRYNARIA.

DRYNARIA LINNÆI. (Bory.) Rhizome stout, the scales 1-2 lin. long broadly ovate, with a short acumen from a peltate base; fronds dimorphous, the barren ones sessile, brown, rigid, bluntly lobed; the fertile ones long-stalked, 2-3 feet long, 6-12 inches broad, cut down nearly to the rachis into entire erecto-patent lanceolate lobes; texture rigid, both sides naked; main veins distinct to the edge, with copious irregular areolæ between them, with copious small sori.—*Polypodium aparisorum. Desv.—Hook. Syn. Fil. p.* 368.

Hab. Ceylon, Malacca, Tropical Australia, Solomon Isles. Differs from *D. quercifolia* by its scattered sori.

PLATE No. CCCXV.



...aria Linnaei (Bory.)

Dumphy del.

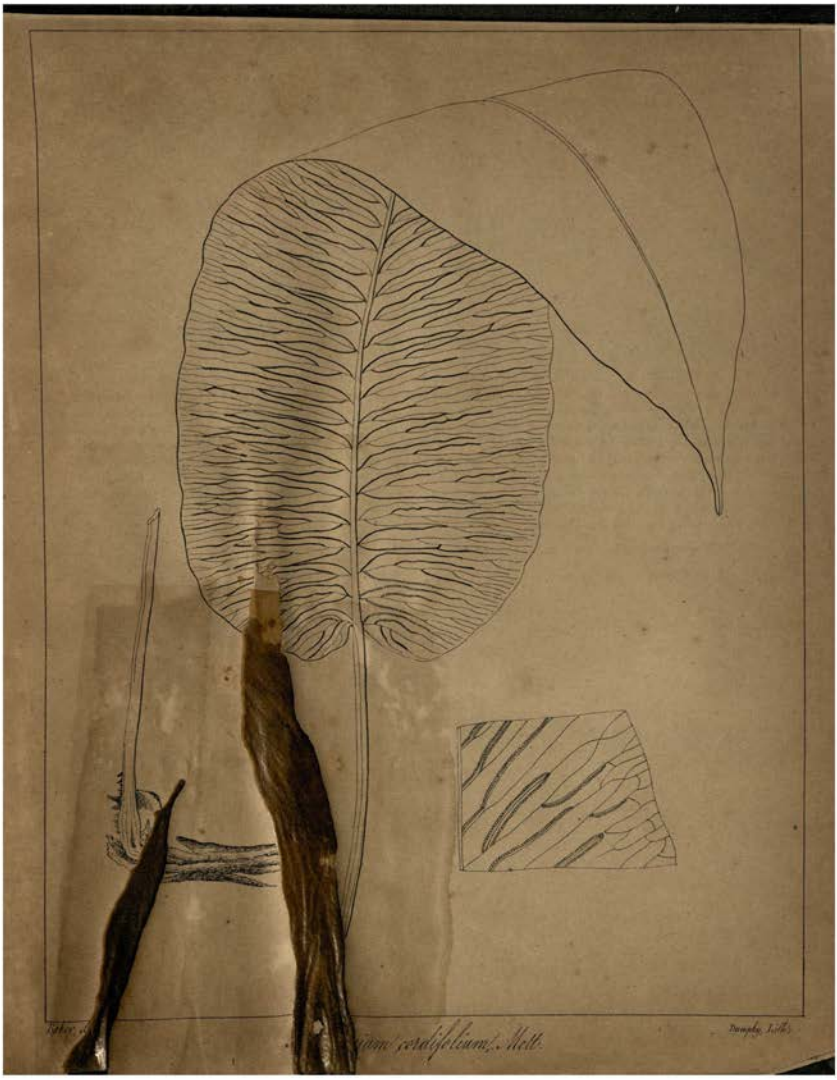
ANISOGONIUM.

ANISOGONIUM CORDIFOLIUM. (Mett.) Caudex rather stout erect, throwing out wiry roots, stipites 6 inches to a foot and more long, paleaceous especially towards the base, fronds 6-8 inches to a foot long, subcoriaceous simple and oblong acuminate entire cordate at the base, and there subpinnato-lobate with oblong very obtuse segments, and often proliferous or pinnate pinnæ 3-5 lateral ones horizontally patent sessile or nearly so, oblong-ovate acuminate subobliquely cuneate at the base, 3-4 inches long, terminal one very large long-petiolate 6-8 inches long acuminate cordate at the base, veins patent dichotomously fasciculate anastomosing towards the margin, sori very long and narrow, often diplazioid and anastomosing, involucres very narrow brown membranaceous. *Hook. Sp. Fil.* iii. *p.* 267 ;—Aspl. integrifolium, *Metten. Asp'en. p.* 171. 1. Frond sentire or nearly so, A. cordifolium, *Metten. Fil. Hort. Lips. p.* 74. t. 12. f. 6. Diplazium, *Bl. En. Fil. Jav. p.* 190 ;—*Hook. Ic. Pl. t.* 184. Aspl. ovatum, *Wall. Cat.* n. 195. Oxygonium, *Pr. J. Sm.* Callipteris, *J. Sm.* 2. Fronds pinnate, pinnæ 3-5. Diplaz. integrifolium, *Bl. En. Fil. Jav.* p. 190. Diplazium, *Hook. Ic. Pl. t.* 936. Anisogonium, *Pr.* Diplazium Zollingeri, *Kze.* (*Fide. Metten.*)

The specimen figured is from Penang.

Hab. Penang, Singapore, Java, Isle of Leyte.

PLATE No. CCCXXXI.



CALLIPTERIS.

CALLIPTERIS SMITHIANA. (Baker.) *Caudex* oblique, decumbent; stipes thick, 1 ft. long, slightly scaly below, furfuraceous throughout and rather densely muricated; fronds 18 to 24 inches long, by nearly as broad, with 4-5 pinnate *pinnæ*, and 4-5 that are only pinnatifid below the point on each side, the lowest 3 inches apart, about 9 inches long, 4 inches broad; *pinnules* sessile, 2-3 inches long, $\frac{3}{4}$-$\frac{1}{2}$ inch broad, the edge subentire, the point slightly toothed, acuminated, the base rounded on both sides; *texture* subcoriaceous; both *surfaces* and *rachis* naked, the latter muricated in the lower part; *veins* in groups of 2-3 on a side, the groups usually joining halfway across to the edge; *sori* often $\frac{1}{4}$ inch long. *Syn. Fil.* p. 245. A. dilatatum, *J. Sm.* (*non Blume*)

Hab. Ceylon.

PLATE No. CCCXXXII.

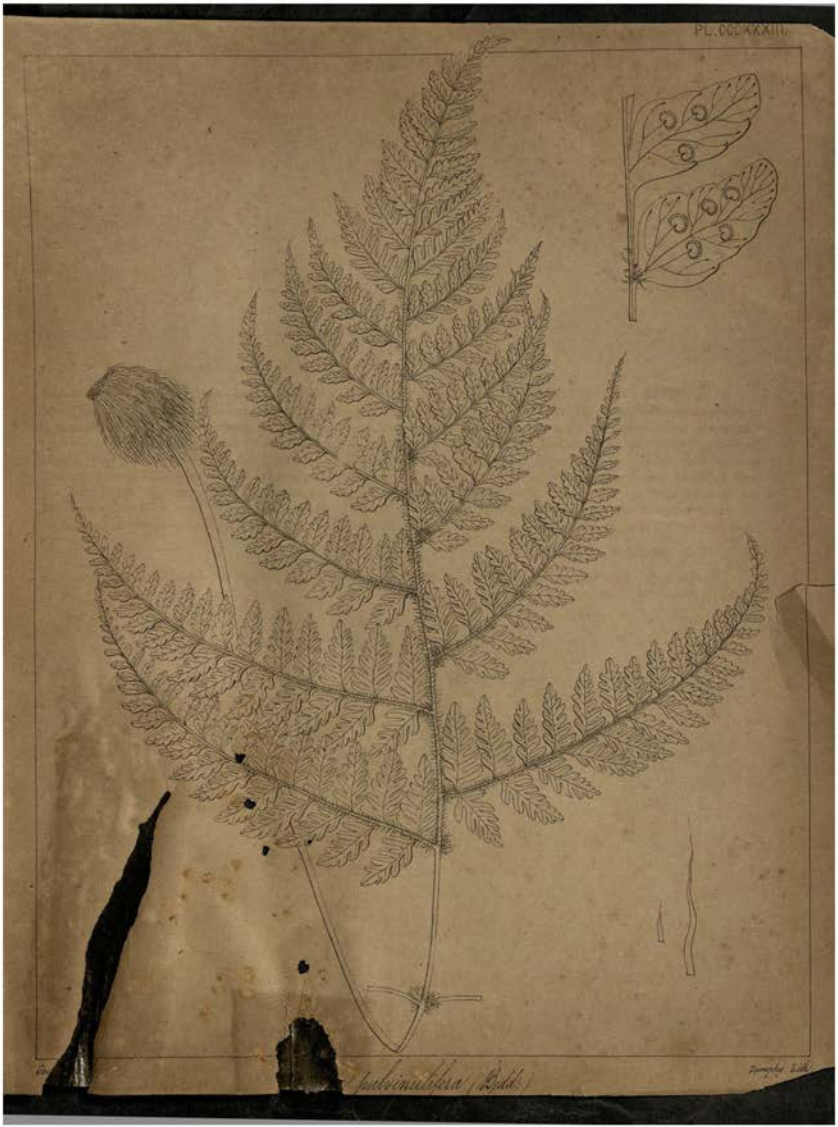
LASTREA.

LASTREA PULVINULIFERA. (Bedd.) Caudex ? stipe up to 30 inches long, furnished with a dense cushion-like mass of golden scales at the base (as in L. odorata), and clothed throughout (especially in the older specimens) as are the rachis and partial rachises with numerous hair-like black scales, which proceed from a broad base, and which are generally more copious at the axils of the pinnæ ; fronds ample, up to 30 inches long (without the stipe) by 18 inches broad near the base deltoid tripinnate coriaceo-herbaceous ; pinnæ gradually decreasing in size from the base to the apex, lower pair opposite, large deltoid with the pinnules of the lower margin much the largest, remaining pinnæ alternate or rarely subopposite or opposite ; pinnules up to 4 inches long in the basal pinnæ, with their secondary pinnules equal to the primary pinnules on the upper parts of the frond ; segments obtusely rounded, entire or lobed, and occasionally dentate or crenate, glabrous on both sides, but sometimes furnished with a few weak setæ on the costules and veins on the upper side ; veinlets inconspicuous, terminating within the margin ; sori terminal on the lower veinlet ; involucre reniform glabrous.

Hab. Himalayas.—(Dr. Jerdon.)

Allied to L. sparsa, but more compound and well distinguished by its hirsute clothing and dense cushion-like mass at the base of the stipes ; the texture is that of L. sparsa.

PLATE No. CCCXXXIII.


PL. CCCXXXIII.
pulvinulifera (Bdd.)
Humphr. Lith.

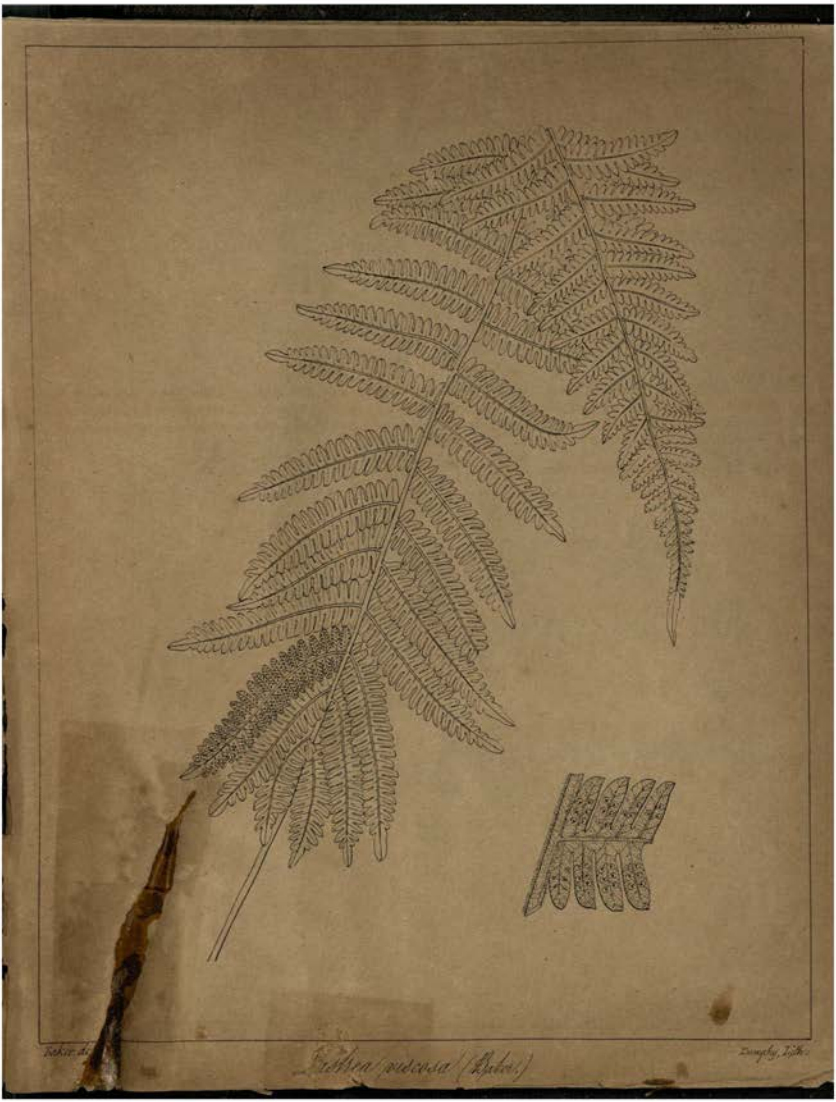
LASTREA.

LASTREA VISCOSA. (Baker.) *Stipe* 6 inches or more long, firm, erect, reddish brown, slightly scaly, finely *villose*; *fronds* 9-12 inches long, 4-5 inches broad, oblong lanceolate; *pinnæ* close, 2-3 inches long, $\frac{3}{4}$-$\frac{1}{2}$ inch broad, cut nearly to the rachis into close, spreading linear-oblong lobes under 1 line broad; *texture* herbaceous; *colour* dark-green; *rachises* villose; under *surface* densely glandular; *veinlets* 5-6 on a side; *sori* medial. *Syn. Fil. p.* 264. Lastrea, *J. Sm.*

The specimen figured is from Malacca.

Hab. Malacca, Philippines and Borneo.

PLATE No. CCCXXXIV.



Fastrea viscosa (Baker.)

LASTREA.

LASTREA GRISEA. (Baker.) Stipes, firm, erect, grey, villose upwards; *fronds* 1½-2 feet long, 8-9 inches broad, oblong-lanceolate; *pinnæ* close, 3-4 inches long ¾-⅝ inch broad, narrowed gradually from the base to the apex, cut down nearly to the rachis into blunt, entire lobes, 2 lines broad, with recurved edges; *texture* subcoriaceous; *rachis* villose, and veins beneath slightly so; *veinlets* about 10 on a side, mostly forked; *sori* small, submarginal; *involucre* ciliated. *Syn. Fil. p.* 271.

Hab. Cochin (only detected by the Reverend Mr. Johnstone).

PLATE No. CCCXXXV.

Baker. Lamphy lith.

Lastrea grisea (Baker)

LASTREA.

LASTREA SPINULOSA. (Desv.) *Stipes* tufted, about 1 foot long, sparingly clothed with ovate concolorous scales; fronds 12-18 inches long, 6-8 inches broad, oblong-lanceolate; lower *pinnæ* subdeltoid, 3-4 inches long, 1½-2 inches broad, the lowest pair about equal to the next; *pinnules* ovate-lanceolate, the largest about 1 inch long, ½ inch broad, cut down to the rachis below into close oblong lobes with copious aristate teeth; *texture* herbaceous, rachis stramineous, scarcely scaly; under surface not glandular; *colour* pale-green; *involucre* not gland-ciliated. *Hk. Brit. F. t.* 20.—*β. Nephrodium dilatatum*, Desv.; *scales* denser and narrower, dark-brown in the centre; *fronds* ovate-lanceolate or subdeltoid, larger and more deeply cut, the *colour* a darker and brighter green; the *pinnæ* closer, the under *surface* often finely glandular, the *involucre* gland-ciliated. *Hk. B. F. t.* 19.—*γ. N. remotum* (A. Br. sub Aspid.); *scales* lanceolate, concolorous, extending to the rachis; *fronds* oblong-lanceolate, about 2 feet long, 6 inches broad; *pinnæ* lanceolate, close; *pinnules* ovate-oblong, only the lowest free, the largest about 1 inch long, ½ inch broad, cut half-way down to the rachis or more, spinulose teeth few; under side and *involucre* not glandular. *Hk. Brit. F. t.* 22.—*δ. N. Bootii* (Tucker, sub Aspid.); habit and scales of *a*; *pinnæ* distant, lanceolate; lowest *pinnule* scarcely free, the largest about ½ inch long, ½ inch broad, cut from one-third to half-way down to the rachis below. L. collina, *Newm.*—*ε. lepidota*, Moore; rachises chesnut brown, scaly; *fronds* subdeltoid; lower *pinnæ* deltoid, 5-6 inches each way; lowest *pinnules* much the largest, often 3 inches long, 2 inches broad, its *segments* cut down to the rachis below and with lobes again deeply pinnatifid.—*Syn. Fil.* p. 275.

Hab W. Himalayas, Arctic Europe and America, southward to Madeira, the Mediterranean and Carolina, Bourbon and Cape Colony. A very variable plant.

PLATE No. CCCXXXVI.

Lastrea spinulosa (Desv.)

SAGENIA.

SAGENIA GRIFFITHII. (Baker.) *Stipes* 1-2 feet long, brownish, not glossy; *fronds* 3-4 feet long, with a large terminal *pinna* cut down nearly to the rachis in the lower part into lanceolate divisions, with deep lanceolate acuminate lobes, below this several pinnæ on each side, the lowest deltoid, 1 foot or more long, by nearly as broad, deeply pinnatifid above, pinnate below; *texture* papyraceo-herbaceous; main veins distinct to the edge, with copious free included veinlets; *sori* rather large, in two rows, nearly all terminating free veinlets. *Syn. Fil. p.* 300.

Hab. Birmah. Nearly allied to Sagenia coadunata, but the venation is closer, and it has copious free veins and sori not on the connected veinlets.

PLATE No. CCCXXXVII.

Sagenia Griffithii (Baker.)

CHEILANTHES.

CHEILANTHES FRAGRANS. (Webb. and Barth.) Stipes cæspitose, wiry, 1-3 inches long, densely clothed with reddish brown linear scales ; *fronds* 2-3 inches long, about 1 inch broad, ovate-acuminate, bi or tripinnatifid ; *pinnæ* opposite, ¼-⅔ inch long, ⅓-½ inch broad, deltoid, cut down to the rachis below into several sinuato-pinnatifid linear-oblong lobes ; *texture* subcoriaceous ; *rachis* polished but slightly scaly, both surfaces green and naked ; *sori* small, copious ; *involucre* light-brown, membranaceous, toothed.—*Syn. Fil.* p. 134 ;—*Hook. Sp. Fil.* ii. 81. Polypodium fragrans, *Linn.* C. odora and suaveolens, *Swartz.* C. Maderensis, *Lowe.*

The specimen figured is from the Himalayas.

Hab. N. W. Himalayas (5,000 ft.)—South of France, Spain, Italy, Greece, Turkey, Canaries, Madeira, Algeria, Syria, and Afghanistan.

PLATE No. CCCXXXVIII.

Cheilanthes fragrans (Willd. & Kaulf.)

PÆCILOPTERIS.

PÆCILOPTERIS SUBREPANDA. (Hook.) *Rhizome* woody, wide-creeping; *stipes* of barren *fronds* stout erect, nearly naked; barren *fronds* varying from simple, 1 foot long, 1½-2 inches broad, to 2 feet long, 1 foot broad, copiously pinnate, with several linear-oblong entire or subrepand *pinnæ* on each side, which are sometimes 6-9 inches long, 2 inches broad; *texture* subcoriaceous; *surfaces* and *rachis* naked; main *veins* distinct nearly to the edge, with copious areolæ with free veinlets between them; *fertile fronds* like the others, but smaller. *Syn. Fil. p.* 419;—*Hook. Sp. Fil* v. *p.* 275.

The specimen figured is from Penang.

Hab. Penang, Luzon.

PLATE No. CCCXXXIX.

Baker, del.

Pœcilopteris subrepanda (Wook.)

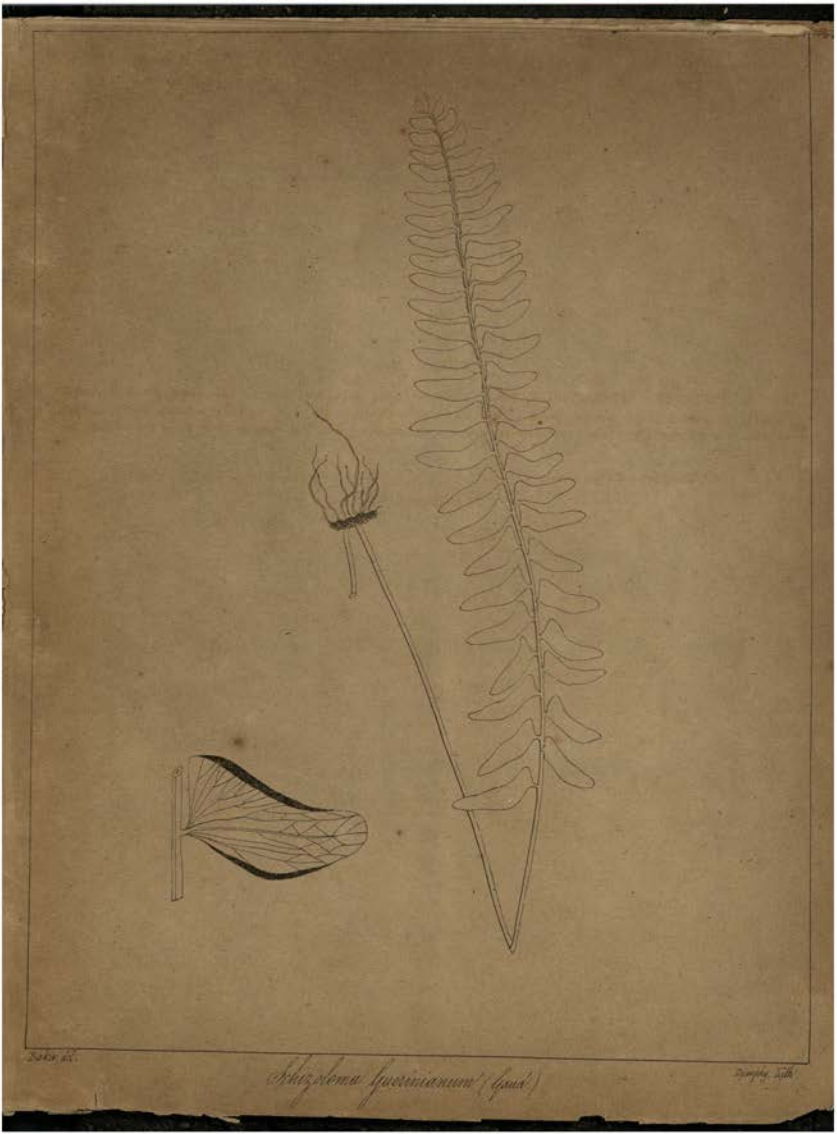
Dumbly, lith.

SCHIZOLOMA.

SCHIZOLOMA GUERINIANUM. (Gaud.) *Rhizome* creeping, paleaceous; *stipes* 4-6 inches long; *fronds* 6-9 inches long, oblong-lanceolate, simply pinnate; *pinnæ* ½-¾ inch long, ovate or oblong, nearly entire, horizontal or falcate, slightly auricled at the base on the upper edge; *texture* subcoriaceous; *sori* in a continuous line along both margins. *Syn. Fil.* p. 111;—*Hook. Sp. Fil.* i. p. 231.

Hab. Malay Peninsula and Islands.

PLATE No. CCCXL.



Baker, del.

Schizolema Guerinianum (Gaud.)

Dimphy, lith.

WOOLSIA.

WOODSIA LANOSA. (Hook). *Fronds* oblong pinnated, quite shaggy with most copious soft long ferruginous hairs, mixed with very narrow, long, chaffy subulate scales ; *pinnæ* subcordate, dentate or lobato-dentate, scarcely pinnatifid. *Syn. Fil. p.* 47.

The specimen figured is from Kumaon, alt. 11,000 feet.

Hab. N. India ; Kumaon mountains 11-12,000 feet. Sikkim, alt. 14-16,000. Perhaps a sericeo-tomentose state of the European W. hyperborea.

PLATE No. CCCXLI.

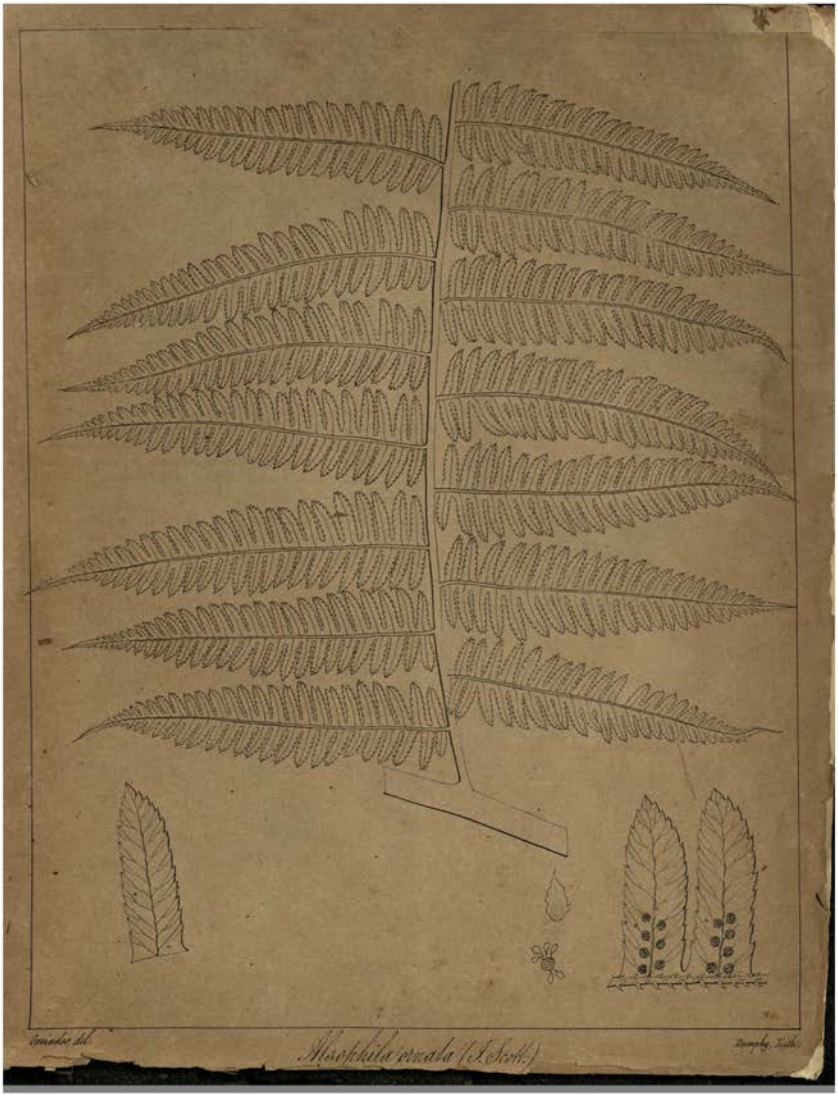
Woodsia lanosa (Hook)

ALSOPHILA

ALSOPHILA ORNATA. (*J. Scott.*) Arborescent, stipes paleaceous at the base, slightly muricated, and as well as the main rachises glossy purplish-brown; *fronds* herbaceo-membranaceous, upper surface glabrous, brownish green when dry, sparsely scaly on the rachis and costæ, increasingly so on the underside of the latter; *primary pinnæ* oblongo-lanceolate, rather abruptly contracted into a short deeply pinnatifid apex; *pinnules* nearly all petiolate lanceolate-oblong acuminate, deeply nearly to the costules pinnatifid, segments oblong ovate in the sterile, (narrow oblong in the fertile), in both obtuse slightly falcate serrated; *veins* forked, rarely twice forked, with a few simple ones; *sori* rather small, about the middle or below the middle of the veinlets on the lower half of the segments. *J. Scott* MS.

Hab. Sikkim, on the banks of the Rungbee, at an elevation of 2,500 feet; called Dang pashin, and Poschok by the Lepchas.

PLATE No. CCCXLII.



Cyriacus del. Dumphy, Lith.

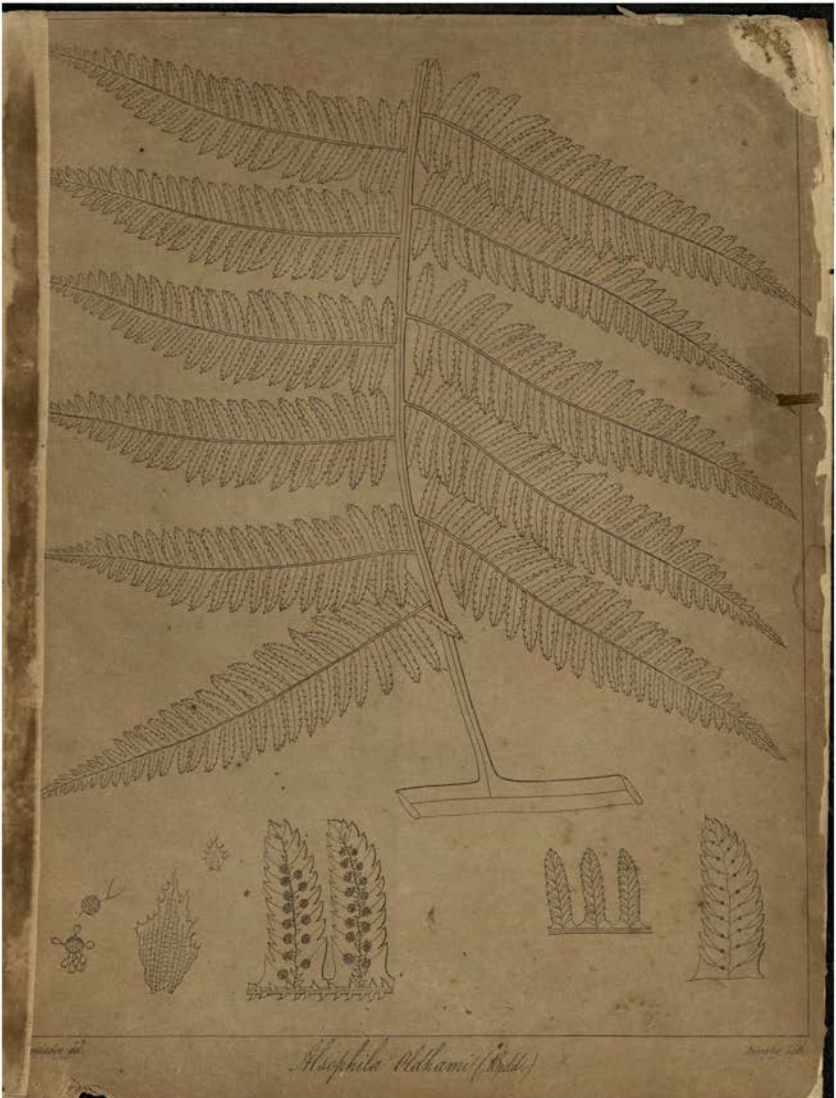
Alsophila ornata (J. Scott.)

ALSOPHILA.

ALSOPHILA OLDHAMI. (Bedd.) Principal rachises-¼ an inch thick, deep purple, asperous; *fronds* ample, tripinnate herbaceo-membranaceous; *primary pinnæ* about 2 feet long by 8-9 inches broad, oblong acuminate, secondary pinnæ 4-5 inches long by about 1 inch broad, lanceolate acuminate, costa beneath very scaly, above slightly hairy, cut down nearly to the rachis into numerous linear oblong blunt-toothed segments on each side; segments rather distant, with a broad base between each, of very equal breadth in their whole length, glabrous above, scaly on the costules beneath; veins simple (generally), or once forked; sori elevated conspicuous, one to each vein (except the 2-3 upper ones), rather below the middle, spore cases mixed with a few jagged scales.

Hab. Khasya Hills.—(Mr. Oldham.)

PLATE No. CCCXLIII.



Alsophila Oldhami (Bedd.)

§ DIDYMOCHLÆNEÆ.

* * *Veins conniventlly anastomosing.*

MESOCHLÆNA. *R. Brown, Pl. Jav. Rar. 5.*

(Sphærostephanos. *J. Smith* ;—Polypodii. *Sp. Wallich* ;—Stegnogrammatis. *Sp. Fæ.*)

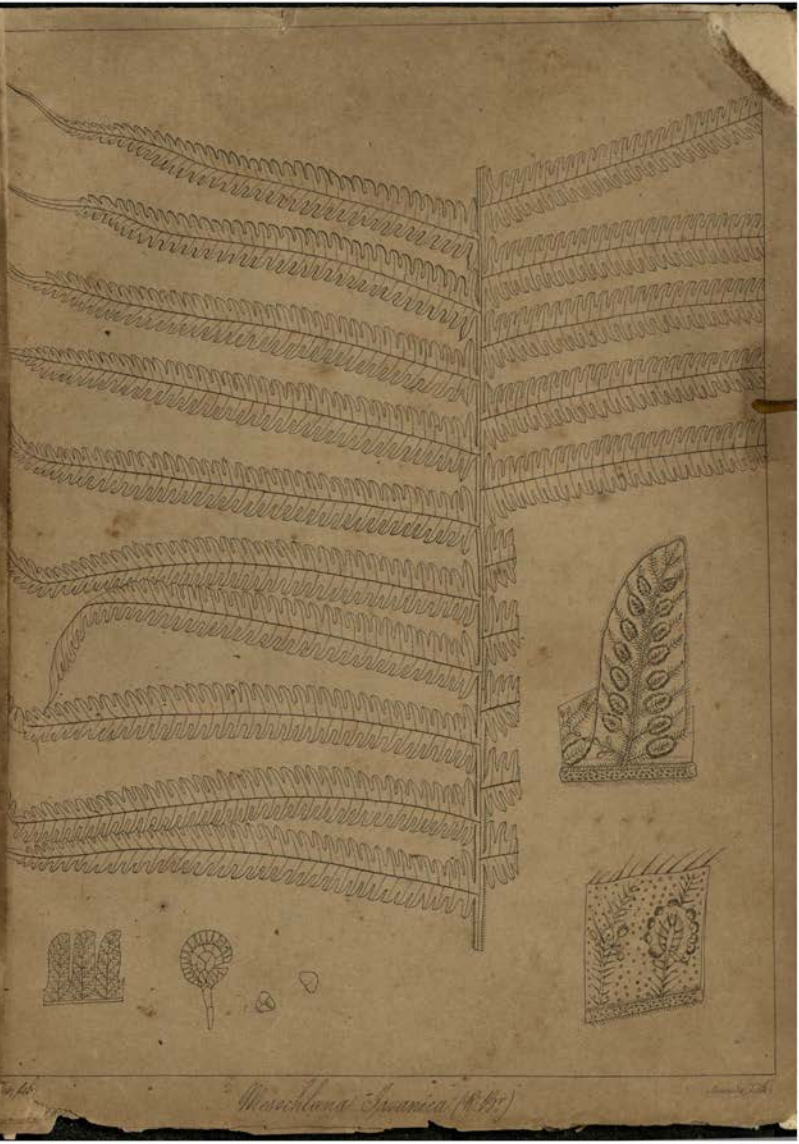
GEN. CHAR : *Sori* indusiate, oblong, parallel, oblique, the *receptacles* medial, crest formed, on the simple veins ; *indusium* membranaceous, rounded at the apex, truncate at the base, attached longitudinally along the middle of the sorus, the margins glandular, free ; *veins* simple, from a central costa, the lower or more opposite pairs angularly connivent-anastomosing (as in Nephrodium.)

Fronds large herbaceous pinnato-pinnatifid hairy, rhizome short erect, sori often crowded and becoming confluent, the indusium then pushed up vertically between the spore cases. (Moore.)

MESOCHLÆNA JAVANICA. (R. Br.) Caudex erect, stipes tufted, short ; *fronds* 2-3 feet long, 12-18 inches broad, simply pinnate ; *pinnæ* close, very numerous, spreading, dwindling down below to mere auricles, the largest 6-9 inches long, ½ inch broad, cut down halfway or more to the rachis into close linear-oblong lobes ; *rachis* and lower surface villose ; *veins* very close, pinnated, 12 or more on each side in a lobe ; *sori* small, close, ultimately confluent. Aspid. *Bl. Mett.* ; Nephrodium Javanicum, *Hk. Sp.* iv. *p.* 67., *Fil. Ex. t.* 61 ; Mesochlæna, *R. Br.* MSS. ; Sphærostephanos, *J. Sm. Syn. Fil. p.* 248.

Hab. Malayan Peninsula and Islands.—Habit and venation of *Eupolypodium, M. asplenioides*, J. Smith, is a villose variety with narrower pinnæ than usual, with short oblong-deltoid lobes.

PLATE No. CCCXLIV.

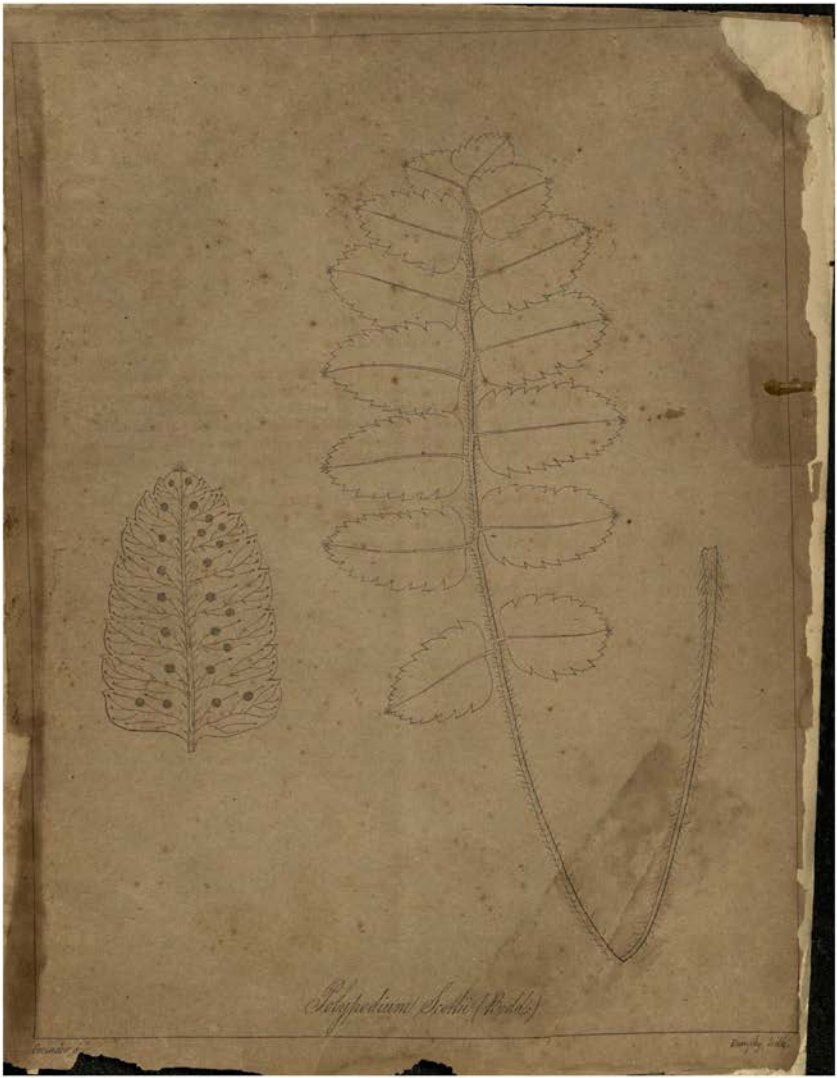


POLYPODIUM.

POLYPODIUM SCOTTII. (Bedd.) Caudex suberect, stout tufted, clothed with brownish-black subulate scales as is the base of the stipe, fronds pinnate oblong with the stipe 10-12 inches long, by about 3 inches broad, rachis furnished with hair-like scales, pinnæ alternate 6-7 approximated pairs, with a terminal one, lower pair not much decreased in size, all short oblong or ovate obtuse from a square unequal base about 1¼ inches long, by a little less than 1 inch broad, and furnished with falcate acute serratures, glabrous on both sides but with a few weak setæ or scales on the costa and veins, especially beneath, veins in pinnate groups, the lower veinlet or the two lower not reaching more than halfway to the margin, upper ones terminating in a dot within the margin, sori medial on the lower 2-3 veinlets.

Lately discovered by Mr. J. Scott in the valley of the Rungio (elevation 2,000 feet), near the Govt. Cinchona Gardens. The venation is that of Lastrea cuspidata, and it may perhaps be an abnormal form of that species.

PLATE No. CCCXLV.


Polypodium Scolii (Forsk.)

DESCRIPTION OF SPECIES NOT FIGURED.

LINDSÆA PECTINATA. (Blume.) Rhizome stout, wide-creeping, scandent, paleaceous; *stipe* erect, very short; *frond* 12-18 inches long, 1-2 inches broad, simply pinnate; *pinnæ* ½-¾ inch long, ¼ inch deep, the lower line nearly straight, the upper margin round, slightly crenate, the point not very blunt, close together, but not imbricated; *texture* pellucido-herbaceous; *sori* in an interrupted line along the upper edge. *Hk. Sp.* i. *p.* 287. L. oblongifolia, *Reinw. Hk. Sp.* i. *p.* 206 *t.* 61 *D.*;—*Syn. Fil. p.* 106.

Hab. Assam and Malayan Peninsula and Islands.—Habit of Lindsæa *repens. L. Calomelanos*, Kunze, from Java, is said to be closely allied.

NIPHOBOLUS FLOCCIGERUS. (Mett.) *Rhizome* wide-creeping, the scales squarrose, lanceolate-acuminate, bright ferruginous; *stipe* very short; *fronds* 6-12 inches long, ½-½ inch broad, narrowed gradually to both ends, the edge entire; *texture* rigid, coriaceous; upper *surface* naked, lower densely matted with subferruginous tomentum; *veins* hidden; *sori* immersed amongst the tomentum, covering the whole upper part of the frond. *Hook. Sp.* v. *p.* 45. Antrophyum niphoboloides, *Hk. Sp.* v. *p.* 94;—*Syn. Fil. p.* 351.

Hab. Northern India, Philippines, Malacca.—Most like *N. porosus*, but the frond much narrower and texture more rigid.

SELLIGUEA CAUDIFORMIS. (Hook.) *Rhizome* woody, creeping, the scales large, pale-brown, lanceolate; stipe 6-9 inches long, firm, erect, glossy, pale-brown; frond 6-9 inches long, ovate-oblong acuminate, the sterile ones 3-4, the fertile ones 1-2 inches broad; *texture* coriaceous, both sides naked; main *veins* distinct to the edge, the veinlets obscure; *sori* in one continuous or interrupted row between the main veins. *Hook. Sp.* v. *p.* 158;—*Bot. Mag. t.* 3328;—*Syn. Fil.* 389.

Hab. Mergui, Moulmein, and Malayan and Polynesian Isles to Tahiti and New Caledonia.

PÆCILOPTERIS BLUMEANA. (Hook.) *Rhizome* woody, wide scandent; *stipe* of barren *frond* 6 inches long, deciduously scaly; barren *frond* 1-3 feet long, 1 foot or more broad, with numerous sessile *pinnæ* on each side, which are 4-6 inches long, 1 inch broad, the apex acuminate, the edge slightly toothed, the base rounded; *texture* membranous; *rachis* and midrib beneath slightly scaly, areolæ hexagonal, without free veinlets; *fertile frond* with distant pinnæ 4-8 inches long, ½-¾ inch broad.—*β. Samoense*; stipe of barren frond 1 foot long, the central *pinnæ* 2½ inches long, ½ inch broad, more distinctly toothed. *Hook. Sp.* v. *p.* 268;—*Syn. Fil. p.* 423.

Hab. Assam, Java, Philippines, and Samoa.—*Lomagramme pteroides*, J. Sm. Hk. Gen. Fil. t. 97 (Luzon, Cuming), is apparently an abnormal form of this, with the sori in a line along the edge of pinnæ rather narrower than the usual barren ones. *A. Hequeniannum*, Gaud., should not unlikely also be referred here.

ELAPHOGLOSSUM NORRISII. (Hook.) Caudex stout, woody, the scales long, linear, dull-brown; *barren frond* sessile, or nearly so, tufted, 12-18 inches long ¾-1 inch broad, the point blunt, the lower half narrowed very gradually; *texture* coriaceous; both *sides* nearly naked; *veins* immersed, indistinct; *fertile frond* much narrower than the other. *Hook. Sp.* v. *p.* 215;—*Syn. Fil. p.* 401.

Hab. Penang, (*Sir W. Norris*), *Maxtier*.—Not unlikely identical with the Javan *A. melanostictum, Blume*. It is like flaccidum in the shape of the barren frond, but the texture is that of *conforme* and *latifolium*, and the fertile frond also is subsessile.

NOTES ON THE NOMENCLATURE.

Polybotrya appendiculata and P. aspleniifolia, are considered as varieties of one and the same species, and are included under the former name by the authors of the Synopsis Filicum.

The fern figured as Poecilopteris contaminans, *Wall.*, (Pl. CCII. Ferns of Southern India) is, I believe, Wallich's plant, but is also probably the same as P. semicordata, *Moore*, (Pl. CCLXX. Ferns of British India.)

Poecilopteris terminans, *Wall.*, and P. costata, and its varieties, are all placed under P. virens in the Syn. Fil.

Lomaria elongata = L. Pattersoni, *Spreng.* in the Syn. Fil.

Gymnopteris Feei comes under G. lanceolata, Hook. It is probable that G. Feei, axillaris and variabilis are all forms of one species, and perhaps also G. minus.

Lindsæa Lobbiana is considered only a form of L. cultrata.

Schizoloma Griffithianum is considered only a form of S. ensifolium.

Pl. CCIX. of Ferns of British India is described in the Synopsis as Lindsæa, Parishii, but in the addenda, it is stated that it is probably an abnormal form of Lomariopsis sorbifolia.

Adiantum Edgeworthii and soboliferum are both placed under A. caudatum.

Cheilanthes myriophylla, given in the Synopsis as a native of the Nilgiris, is, I believe, only introduced.

Pteris Otaria is considered an abnormal form of P. quadriaurita.

Diplazium decurrens, Bedd., is placed under D. maximum, Don.

Diplazium asperum and D. polypodioides are considered forms of the same species under the latter name.

Diplazium assimile, and D. Jerdoni, are also both considered as forms only of D. polypodioides.

It is very probable that all the Antrophyums are forms of one variable species.

Gymnogramma Javanica and serrulata are considered to be forms of the same species.

Polypodium ornatum, Wall., is included under L. setigera; they are however very distinct species.

Goniophlebium argutum, *Wall.*, is included under G. subauriculatum, *Bl.*

Pleopeltis longissima. I have never met with this species if distinct from P. nigrescens, all the S. Indian and Ceylon forms clearly belong to nigrescens.

Drynaria mollis, *Bedd.*, is D. rivalis, *Mett.* MSS., of Synopsis Fil.; but the former name is the older of the two.

Cyrtomium caryotidium, *Presl.*, is considered as only a form of C. falcatum.

Polystichum aculeatum and angulare are considered forms of one species.

Polystichum cæspitosum, *Wall.*, is considered a form of P. auriculatum, *Sw.*

Sagenia caudata is placed under S. cicutaria.

Nephrodium lineatum is placed under N. glandulosum.

Nephrodium propinquum becomes N. unitum, and N. unitum becomes N. cucullatum, *Baker*; the older names are however long established.

Lastrea aristata and L. boniifolia are considered as one and the same.

Lastrea calcarata and falciloba are also considered as one and the same.

Lastrea cochleata, elongata, patentissima and odontoloma are all considered as forms of L. Filix-mas.

Lastrea octhodes and tylodes are united under the name of L. prolixa, Baker.

Trichomanes plicatum and insigne are included under T. Filicula.

Hymenophyllum Blumeanum is included under H. polyanthos.

Anemia Wightiana is included under A. tomentosa.

I have doubts about most of the above alternations, so I have not altered the nomenclature, but they should receive the attention of Botanists who have the chance of examining growing plants.

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